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OF GLASGOW

(INCLUDING THE PROCEEDINGS OF THE SOCIETY).

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OF THE

Natural History Society of Glasgow.

Note on the Pelagic Fauna observed off the West Coast of Arran during the Months of August and September, 1905.

By J. Graham Kerr.

[Read 30th January, 1906.]

The Pelagic Fauna of the Firth of Clyde has probably attracted the attention of a greater number of distinguished investigators than that of any other portion of the seas adjoining the British Islands. Yet it is remarkable how small is the volume of published records as compared with the volume of research which has been done. When the working zoologist seeks for information, say, as to the particular localities and the particular times of year at which he may expect to be able to obtain larval or other developmental stages of even the most important forms, he finds his task in great part a fruitless one. It is greatly to be hoped that the authorities of the Millport Marine Station may be able before long to undertake and publish the results of a systematic faunistic survey of the Firth of Clyde, giving accurate details as regards localities and dates. In the meantime it is of importance that individual observers of the Clyde

plankton should record their observations, however scanty, so that they may be available for future workers. It is on this account that I venture to offer to the Society some short notes upon plankton observed during the months of August and September last off the village of Blackwaterfoot, Arran. I may explain that my object in carrying out these observations was not to look for new species or to collect any great variety of forms, but to investigate the occurrence, and to obtain supplies of properly preserved laboratory material, of forms—especially larval forms—of recognised general importance to the zoologist.

The net used was a surface one of the standard size used by E. T. Browne, and composed of bolting silk of sixty meshes to the inch.

Protozoa and Coelenterata.—As larval forms were the chief objects of investigation, little attention was paid to the above-mentioned Phyla. It should be mentioned, however, that Acanthometrid Radiolarians occurred occasionally in the surface waters.

Of Medusæ the two commonest forms during August were *Phialidium temporarium*, Browne, and *Sarsia gemmifera*, Forbes, the latter frequently with numerous daughter Medusæ budding off from the elongated manubrium, and most frequently with the umbrella turned inside out. Such colonies, as they may be termed, of Medusoid individuals have a wonderfully suggestive appearance in connection with the possible mode of evolution of the highly specialised pelagic colonies so characteristic of the Siphonophore. It seems quite possible that the pneumatophore, or float at the top of the Siphonophore, may have evolved directly from the reversed umbrella of the Medusoid ancestor.

About the middle of September the beautiful *Tiara pileata* (Forsk.) became numerous, the specimens mostly being adults with well-developed gonads.

Nemertea. — *Pilidium* appeared on only two occasions — on 18th August and 18th September.

Polychaeta.—As was to be expected, there was a considerable variety of larval forms of Polychaete worms. Two attracted special attention. These were the wonderful larva of *Chaetopterus*, with its characteristic mesotrochal arrangement of cilia,

and an exquisite trochophore larva—a typical "Loven's Larva." This latter attracted attention at once by its conspicuous difference from the Mediterranean Polygordius larva described by Hatschek, in the fact that the trunk region developed within the body of the larva, as described by Woltereck for the North Sea type of Polygordius. I have submitted a specimen to Prof. Woltereck, who is our chief authority on the larva of Polygordius, and he assures me that the Blackwaterfoot larva belongs to the North Sea form, *Polygordius lacteus*. The Polygordius trochophores were got in large numbers at the surface on 25th September, with a light northerly breeze off the land. They were first got on 18th September.

Mitraria.—This interesting form, which is stated by Watson to be the larva of *Owenia filiformis*, D.Ch., appeared in the tow-net on 6th September. The specimen obtained appears to come closest to *M. skifera*, Häcker, which was obtained by the Plankton Expedition in the Atlantic, about 200 miles west of the Hebrides. It differs, however, from this "species" in that the chief chaetae have sharper points, and that the needle-shaped chaetae are much longer.

It should be noted that, although Mitraria is not included in the British Association fauna list, it was obtained by Claparède* in September, 1859, in Lamlash Bay. The specimen obtained by Claparède differs considerably from the Blackwaterfoot specimen, and would probably be looked on by describers of Mitraria as a different species; but it appears very inadvisable to accord specific rank to such larvae as these until we are acquainted with their life-history, and with the changes which take place in their characters during development.

Besides various Spionid and other larval Polychaetes, various adult forms of pelagic habit appeared from time to time in the tow-net.

Tomopteris occurred on various occasions, especially about the middle of September. The sexual individuals of *Autolytus prolifer*, both male ("Polybostrichus") and female ("Sacconereis"), occurred occasionally along with those of at least two other species of *Autolytus*. Amongst these should be

* Zeits. wiss. Zool. Bd. X. s. 407.

mentioned a peculiar female differing from *A. prolifer* in its more elongated form (forty-five segments), but more conspicuously in the fact that it carries its eggs, not in a single rounded mass, but in a number—eight in the one specimen obtained. I have not, so far, succeeded in identifying this satisfactorily.

Towards the end of September, headless sexual portions of large Syllids were observed swimming about at the surface, discharging their gametes.

Mollusca.—Only two molluscan larvae call for special mention. The first of these is the beautiful veliger of the nudibranch *Aegires punctilucens* (d'Orb.),* with large bilobed velum, which hangs down on each side, so as to give it a Pilidium-like appearance. This was got only on one occasion—on 29th August.

Lamellaria. — A beautiful Echinospiroid pelagic larva, with large glassy shell, was obtained on 29th August. Dr. Paul Pelseneer recognised the specimen at once as the larva of Lamellaria. As *L. perspicua* (Linn.) occurs on the Clyde, the larva in question is in all probability to be referred to this species.

Echinoderm Larvae.—Four different larval forms of Echinoderms were conspicuous in the surface fauna. By far the most abundant was the Ophiopluteus larva of *Ophiothrix fragilis* (Abilg.), which occurred in large numbers on various occasions during September. Plutei of *Echinus* occurred in numbers on 10th August, but were only seen occasionally on other dates. The magnificent pluteus of *Spatangus purpureus* appeared irregularly in small numbers.

Besides these, occasional barrel-shaped larvae of Synapta and other Holothurians appeared.

Polyzoa. — The well-known Cyphonautes type of larva frequently occurred in large numbers near the shore. It is noteworthy that the Cyphonautes was not the familiar *C. compressus* —now known to be the larva of the common Polyzoon *Membranipora pilosa* — but *C. schneideri*, Lohmann, which was

* Mr. Bles informs me that he succeeded, in 1894, in company with Mr. Garstang, in tracing the development of this larva into the adult.

Foetus of Megaptera.

described by Schneider* in 1869, and whose adult form is not yet definitely determined.

Phoronidea.—Actinotrocha occurred frequently in the surface net during both August and September. On 16th August, in a flat calm, several specimens were got in the tow-net in the act of metamorphosing. On 10th August two young but completely metamorphosed specimens of Phoronis, each contained in a membranous tube, with sand grains attached to its surface, were obtained in the surface net. As the specimens were entangled in small masses of an Ectocarpus-like Alga, their occurrence at the surface was doubtless accidental. Although in habit these young specimens, with their free membranous tubes with adherent sand grains, agree with the Mediterranean *P. psammophila* rather than with *P. hippocrepia*, it would be rash to assert definitely that they do not belong to the latter species.

Tornaria appeared only once in the surface net — on 10th August.

Tunicata.—The surface waters were frequently swarming with Appendicularians. Although the individuals varied greatly according to state of maturity or degeneration, all the specimens carefully examined appeared to be the common *Oikopleura dioica*, Fol.

Notes on certain Specimens of General Zoological Interest exhibited.

By J. Graham Kerr.

[Read 30th January, 1906.]

The following interesting zoological specimens have recently come into my hands, and are destined to be placed in the zoological collection of the University of Glasgow:—

1. *Megaptera longimana*, Gray. — The first specimen is a fœtus—apparently the smallest so far recorded—of the Humpback

* Arch. mikr. Anat. Bd. V. The larva in question is here mentioned as "Zweite Species."

Whale which had been presented by His Excellency Sir William MacGregor, K.C.M.G., Governor of Newfoundland. The fœtus measured 190 mm. in length, measured along the curved dorsal surface from tip of head to tip of tail. The specimen, which is represented on Plate I., showed, among other interesting features, a well-developed anal fin, the existence of which in whales had recently* been called in question, although already indicated for the young of this species in a figure by G. O. Sars.† A series of microscopic sections through one-half of the lower jaw demonstrated the presence of a series of fourteen tooth germs. Sections through the palate showed a uniform coating of epithelium without any indications of approaching "whale-bone" formation.

2. Amongst other objects exhibited were specimens of remarkable balls of hair from the uterus of a fur seal (probably *Otaria ursina*), and pointing to the occurrence of a particularly well-developed *lanugo* in this form.

3. *Pennella balaenopterae*, Kor. and Dan. — There were exhibited several specimens of this gigantic Copepod, which lives as a parasite on whales. The specimens measured about 250 mm. in length, exclusive of the egg strings. They had also been obtained by Sir William MacGregor, and had been "attached to the host near the line of junction of the dark back with the white belly, and projected about two inches by the narrow end into the blubber; the parasites were numerous." Almost synchronously with the arrival of these specimens there appeared a memoir upon the structure of *Pennella balaenopterae*, by Sir William Turner, based upon specimens from Shetland, and about the same time, I am informed, specimens were obtained by the Cambridge Museum of Zoology. In view of Sir William Turner's full description, it does not seem necessary to describe the specimens of *Pennella*. The specimens exhibited were all females, the male, which is probably of relatively small size, not having been observed.

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* Beddard. *A Book of Whales*, 1900, p. 13.

† Sars. *Fortsalte Bidrag til Kundskaben om vore Bardehvaler*, Tab. 3, Forh. Selsk. Christian. 1880.

4. *Cephalodiscus nigrescens*, Lank.—A fragment of this magnificent species of *Cephalodiscus* was exhibited. The only specimens known were obtained by the "Discovery," and they have been described by Lankester.

5. *Phoronis australis*, Hasw. — This is the largest species known of the interesting genus *Phoronis*. It has been described by Haswell from the Australian coast.

6. Specimens of the remarkable pelagic larvae (*Leptocephalus*) of the conger and of the common eel. Along with the larva of the common eel was shown a specimen which had just completed its metamorphosis into the elver or young eel, which is so frequently seen making its way up our fresh-water streams from the sea.

7. *Glossina palpalis*, Rob. Desv., one of the "Tsetses" of tropical Africa. This species has recently become notorious by its having been proved to be the intermediary in carrying the *Trypanosoma* of sleeping sickness from one human being to another. The fact of this fly being viviparous, the young being born in an advanced stage of development, places great, probably insurmountable, difficulty in the way of carrying out a war of extermination against the insect, even within limited areas.

The Diptera of Clyde (Second List).

By Robert Henderson.

[Read 27th March, 1906.]

Following the plan adopted in my former paper (*Trans. Nat. Hist. Soc. Glas.*, Vol. VII. (New Series), Part II., pp. 148-154), I have distinguished thus (*) the species not given in Mr. P. H. Grimshaw's list (*Fauna and Flora, &c., of Clyde*, 1901), and the species so distinguished in my former contribution are, in the list given below, marked thus (**) wherever their occurrence in other localities is recorded.

Classification and nomenclature.—Verrall: "*List of British Diptera*," *1901*, with a few exceptions, and "*List of British Dolichopodidæ, with Tables and Notes*," *Ent. Mo. Mag.*, Vol. XL., pp. 164-245, and Vol. XLI., pp. 50-252.

Bibliography.—I had intended to note here the various papers, chiefly those in the foreign Transactions belonging to the Society and kept in the Mitchell Library, Glasgow, which I had consulted for the determination of species, but this has been rendered superfluous by the acquisition of the *Katalog der Paläarktischen Dipteren*, Budapest, 1903, in four volumes, of which the three published volumes are now in the Society's library. The *Katalog* is both a synonymic list and a key to the literature of Diptera down to 1st October, 1903.

Abbreviations.—These are as in my former paper quoted above.

Mr. John R. Malloch has been good enough to send to me for inspection or identification a number of flies collected by him during the past season, and to him are due the records given below as "Bonhill," too numerous to be distinguished otherwise, among them being twenty-seven additions to the Clyde list.

Fam. Bibionidæ.

Dilophus femoratus, Mg., - -

albipennis, Mg., - - June. Cartland Crags; Hawkhead Est.; Cambuslang.

The synonymy is given on the authority of the *Katalog der Pal. Dipt.* The ♂ ♂ of my specimens have the legs entirely black, the stigma very faint; and the ♀ ♀, taken at the same time and place, have the fore coxæ entirely, and all the femora more or less, red; the stigma blackish-brown.

Bibio pomonæ, F., - - - July—August. Tarbert; Colintraive; Holy Loch; Gareletter Point; L. Long.

B. leucopterus, Mg., - - - May—June. Erskine; Bowling; Gorge of Avon; Bonhill.

**B. nigriventris*, Hal., - - June. Cambuslang; Cartland Crags.

**B. varipes*, Mg., - - - August. Bonhill.

B. laniger, Mg., - - - May—June. Gen. dist.

B. Johannis, L., - - - May. F. and C. Canal; Kilbowie; Mill Pln., Cadder.

B. lacteipennis, Ztt., - - June. Cambuslang; Possil M.; Lenzie.

Fam. Limnobidæ.

Dicranomyia aquosa, Verr. - Puck's Glen; Wood near Loch Eck (A.R.); Tarbert (A.R.).

Geranomyia unicolor, Hal., - Common at Tarbert, July, 1904 (A.R.).

Chilotrichia imbuta, Mg., - June—July. Common locally. Blairmore; Ardentinny; Hawkhead Est.; Cambuslang.

**Molophilus ater*, Mg., - - Common at Helensburgh Moor, 9th May, 1903 (J. J. F. X. King).

Dactylolabis sp.? - - - May. This occurs freely every year at Gorge of Avon.

**Epiphragma picta*, F., - - About two dozen specimens were taken on 24th June, 1905, Gorge of Avon (R.H. and A.R.).

Attention was called to the species by its vertical flight, rising and falling after the manner of the *Trichocerœ*.

**Limnophila subtincta*, Ztt., - One ♂, 2nd June, 1902 (J. E. Murphy); one ♂, 2nd June, 1904 (R.H.), Possil M.

**Limnophila sepium*, Verr., - July. Common at the mouth of the R. Echaig, left bank; also taken at Blairmore.

**Anisomera aqualis*, Lw., - One ♂, 31st July, 1903; one ♂, 6th July, 1905, Glen Massan.

A. Burmeisteri, Lw., - - This species was recorded in my list (*Fauna and Flora of Clyde*, 1901) as *A. vittata*, Mg., which is a synonym. I add Inch Moan, L. Lomond, to the localities already recorded. The species is common locally, but is given in italics in Verrall's list.

Amalopis occulta, Mg., - Two ♂ ♂, 24th May, 1902, Gorge of Avon; one ♂, 6th July, 1905, Glen Massan.

Fam. TIPULIDÆ.

**Pachyrrhina imperialis*, Mg., - Gen. dist. The form which occurs in this district is *P. scalaris*, Mg., but I had overlooked the synonymy.

**Tipula pictipennis*, Stæg., - One ♂, Strathblane, 19th July, 1899 (the late Geo. W. Ord); one ♀, Blairmore, 12th July, 1901. On 14th May, 1903, some larvæ were found in loose soil under trees at Cartland Crags. These were bred, and from them were obtained three ♂ ♂ and three ♀ ♀, which emerged between 3rd and 26th June (A.R. and R.H.); Tarbert, July, 1904 (A.R.). *Apparently new to Britain.*

**T. pabulina*, Mg., - - - One ♂ and two ♀ ♀ seen on road from Furnace to Crarae, 30th May, 1901, but only one ♀ secured; one ♀, Loch Ridden, 31st May, 1901.

**T. excisa*, Schum., - - - One ♀, Glen Massan, 2nd July, 1905.

Fam. Rhyphidæ.

Rhyphus punctatus, F., - - May—August. Gen. dist., but not so common as *R. fenestralis*, Mg.

Fam. Stratiomyidæ.

**Nemotelus nigrinus*, Fln., - One ♂, Murroch Glen, 19th July, 1902.

**Oxycera pygmæa*, Fln., - - One ♂, 22nd July, 1903, Bonhill.

**O.* [*muscaria*, F., var. ?] - - One ♂, 19th July, 1902, Murroch Glen.

**Sargus flavipes*, Mg., - - One ♀, 17th August, 1899, Fort Matilda, Gourock.

S. cuprarius, L., - - - August. Troon; Possil M. (J.E.M.).

**S. iridatus*, Scop., - - - One ♀, 3rd Aug., 1902, Stepps Wood.

Michrochrysa polita, L., - - June—Sept. Stepps Wood; Bonhill; Possil M. (J.E.M.).

M. flavicornis, Mg., - - - One ♂, 20th June, 1904, Bonhill.

**M. cyaneiventris*, Ztt., - - June—July. Loch Eck; Cadd. Wild. (J.E.M.). In the *Kat. der Pal. Dipt.* this is given as a synonym of *M. flavicornis*, Mg.

Beris vallata, Forst., - - June—July. Loch Eck; Possil M.; Bonhill.

B. chalybeata, Forst., - - May—June. Gen. dist.

B. fuscipes, Mg., - - - Two ♂♂, 24th July, 1902, Possil M.; one ♂, 27th July, 1902, Mill Pln., Cadder.

**B. Morrisii*, Dale, - - - One ♀, 14th August, 1900, Carmyle.

Fam. Tabanidæ.

Tabanus sudeticus, Zlr., - - July. Not uncommon in Argyleshire and Dumbartonshire.

**Chrysops cæcutiens*, L., - - June. F. and C. Canal Bank, Cadder; Hawkhead Est.

C. relicta, Mg., - - - June—July. Not uncommon about Holy Loch and Glen Massan.

Fam. Leptidæ.

Leptis notata, Mg., - - - May—June. Hawkhead Est. Not uncommon.

L. tringaria, L., - - - July—Sept. C. and gen. dist.

**L. lineola*, F., - - - July—Sept. C. and gen. dist.

Atherix ibis, F., - - - One ♂, Gorge of Avon, 25th May, 1901.

Symphoromyia crassicornis, Pz., One ♂, Glen Fruin, 17th June, 1905 (J.R.M.).

**Spania nigra*, Mg., - - - One ♂, Bonhill, 10th June, 1905.

Fam. Asilidæ.

**Leptogaster guttiventris*, Ztt., - June — July. Troon. Not common.

Dioctria Reinhardi, W., - - One ♀, Troon, 9th Aug., 1900 (W. Adam).

Isopogon brevirostris, Mg., - One ♂, Rowardennan, 15th June, 1901.

Philonicus albiceps, Mg., - - August. Troon. Not common.

Fam. Therevidæ.

**Thereva nobilitata*, F., - - One ♂, two ♀ ♀, 23rd June, 1900. Troon.

T. annulata, F., - - - June—Aug. Troon. Not uncommon.

Fam. Empidæ.

Hybos grossipes, L., - - - July—Sept. Gen. dist.
**H. femoratus*, Müll., - - July—Aug. Gen. dist.
Hybos sp.? - - - - June—Aug. Holy L.; Troon; Stepps Wood; Luss Glen; Glen Massan.

This may be the species recorded in the Brit. Ass. Handbook list as *H. culiciformis*, F.

**Cyrtoma nigra*, Mg.. - June—July. Holy Loch; Glen Massan; Inch Tavannach.
C. spuria, Fln., - - - June—August. Cambuslang; Langbank; Helensburgh; Stepps Wood.
Rhamphomyia nigripes, F., - May—June. Murroch Glen; Cambuslang; Hawkhead Est.; Bowling.
R. sulcata, Fln., - - - May—June. Gen. dist.
**R. cinerascens*, Mg., - - May—June. Gen. dist,
**R. spinipes*, Fln., - - - Aug.—Sept. Gartloch; Dougalston (North) Wood; Bonhill.
**R. dentipes*, Ztt., - - - May. Bonhill (*teste* Mr. P. H. Grimshaw).
**R. tenuirostris*, Fln., - - Arran (Mr. Carter) (*teste* Mr. F. C. Adams, in *Ent. Mo. Mag.*, Vol. XLI., p. 94).
**R. anomalipennis*, Ztt., - - May — June. Helensburgh; Bonhill.
**R. plumipes*, Fln., - - - June. Murroch Glen; Helensburgh.
R. flava, Fln., - - - - July—August. Clober Dam; Glen Massan; Murroch Glen; Holy L.; Ardentinny.
Empis opaca, F., - - - June. Monkd. Cl.
**E. borealis*, L., - - - May. Bonhill.
E. punctata, Mg., - - - May — June. Cambuslang; Milngavie.

E. bilineata, Lw., - - -	June. Lenzie; Eaglesham; Possil M.
E. scutellata, Curt., - - -	One ♂, 8th June. 1904, Cambuslang; one ♂, 11th June, 1904, South Bar; one ♀, 23rd July, 1899, Cadder Wild.
**E. brunneipennis*, Mg., - -	3 ♂ ♂, 9th June, 1903, Possil M.
**E. pennaria*, Fln., - - -	June. Possil M.; South Bar; Cambuslang; Bowling; Bonhill.
**E. chioptera*, Fln., - - -	May. Sandbank; Gorge of Avon; Bonhill.
**E. lepidopus*, Mg., - - -	One ♂, 27th May, 1905, Sandbank.
**E. grisea*, Fln., - - -	June—July. Castlemilk; Holy Loch.
**Hilara spinimana*, Ztt.—*cilipes*, Mg., - -	June—July. Blairmore; Rowardennan; Bonhill.
**H. pilosa*, Ztt., - - -	May—July. Possil M.; Ardentinny; Cambuslang; Holy L.
H. interstincta, Fln., - -	June. Murroch Glen; Frankfield L.
H. maura, F., - - - -	May—June. C. and gen. dist.
**H. manicata*, Mg., - - -	June—Sept. Finnich Glen; Holy L.; Stepps Wd.; Dalmarnock.
**H. canescens*, Ztt., - - -	4 ♂ ♂, 15th July, 1902, Cambuslang.
**H. litorea*, Fln., - - -	July. Blairmore; Bonhill.
**H. lurida*, Fln., - - -	July. Blairmore; Holy L.
**H. flava*, Schin., - - -	June—July. Blairmore; Cambuslang; Gorge of Avon; Holy L.; Glen Lean. *This is not in Verrall's list.*
**Oreogeton flavipes*, Mg., - -	July. Holy L.; Cambuslang.
**Trichina flavipes*, Mg., - -	2 ♀ ♀, 30th Sept., 1905, West Ferry Wood, Langbank.

**Ocydromia glabricula*, Fln., - May—Sept. Gen. dist.
**Heleodromia stagnalis*, Hal., - May. Bonhill.
**H. fontinalis*, Hal., - - Feb. and Nov. Cathkin Quarry.
Hemerodromia precatoria, Fln., - June—Sept. Bardowie L.; Glen Massan; Ardentinny; Bonhill.
**Ardoptera irrorata*, Fln., - - June. Bonhill.
Gloma fuscipennis, Mg., - - June—July. Hawkhead Est.; Gorge of Avon; Puck's Glen; Bonhill.
**Trichopeza longicornis*, Mg., - June—July. Ardentinny; Gorge of Avon; Holy L.
Tachypeza nubila, Mg., - - July and Sept. Stepps Wood; Bardowie L.; Holy L.
**Tachydromia longicornis*, Mg., May—June. Possil M.; Bonhill.
**T. agilis*, Mg., - - - June. Possil M.; Hawkhead Est.; Northfield Moor.
**T. flavipes*, F., - - - June. Possil M.
**T. bicolor*, F., - - - - June. Possil M.

Fam. Dolichopodidæ.

Psilopus platypterus, F., - - June—July. Holy L.; Blairmore; Murroch Glen; Mill Pln., Cadder.
**P. Wiedemanni*, Fln., - - August. Troon.
Dolichopus atratus, Mg., - - June—July. Possil M.; Holy L.
**D. picipes*, Mg., - - - June—July. Holy L.; Bonhill.
D. lepidus, Stæg., - - - One ♂, 11th June, 1905, Frankfield L.
D. atripes, Mg., - - - June—August. Gen. dist.
D. vitripennis, Mg., - - - July—Aug. Holy L.; Helensburgh; Loch Eck.
D. discifer, Stann., - - - July. Strone; Loch Eck; Blairmore; Arrochar; Holy L.; Murroch Glen.
D. plumipes, Scop., - - - June—July. C. and gen. dist.
D. pennatus, Mg., - - - June—July. Ardentinny; Bonhill.

D. populāris, Wied., - - June—July. Gen. dist.
**D. signatus*, Mg., - - - June—July. Murroch Glen; Ardentinny; Holy L.
D. urbanus, Mg., - - - July. Luss Glen; Ardentinny; Glen Massan.
D. trivialis, Hal., - - - June—July. Gen. dist.
**D. festivus*, Hal., - - - July. Bonhill.
**D. griseipennis*, Stan., - - July—Aug. Bonhill.
D. nubilus, Mg., - - - July. Holy L.
D. simplex, Mg., - - - June—July. Gen. dist.
**D. brevipennis*, Mg., - - June. Troon.
**D. ruvestris*, Hal., - - July. Murroch Glen.
**Hercostomus nigripennis*, Fln., - July. Luss Glen; Troon.
**Hypophyllus obscurellus*, Fln., - August. Murroch Glen.
Gymnopternus cupreus, Fln., - June—July. C. and gen. dist.
**G. celer*, Mg., - - - - July. Bonhill.
G. ærosus, Fln., - - - June—Aug. C. and gen. dist.
**Chrysotus cilipes*, Mg., - - July. Bonhill.
**C. pulchellus*, Kow., - - July. Bonhill.
**C. gramineus*, Fln., - - July—Aug. Gorge of Avon; Holy L.; Bonhill.
Argyra diaphana, F., - May—June. Murroch Glen; Clober Dam; Erskine.
A. leucocephala, Mg., - - June—August. Gen. dist.
A. argyria, Mg., - - - July—Aug. Glen Massan; Holy L.; Murroch Glen.
A. argentina, Mg., - - - July—August. Gen. dist.
**A. confinis*, Ztt., - - - June—July. Bonhill.
**Thrypticus bellus*, Lw., - - 2 ♀, 1st July, 1905. Benmore Est., Kilmun.
**Porphyrops spinicoxa*, Lw., - June and Aug. Cambuslang; South Bar.
**P. rivalis*, Lw., - - - June. Hawkhead Est.; Erskine.
**P. patula*, Radd., - - - June. Hawkhead Est.; Erskine.
**P. crassipes*, Mg., - - - May—June. Mill Pln., Cadder; Hawkhead Est.; Bowling; Erskine.
**P. consobrina*, Ztt., - - 2 ♂ ♂, 1 ♀, 3rd June, 1905, Bowling.

**P. micans*, Mg., - - - June. Bonhill.
P. riparia, Mg., - - - June. Murroch Glen.
Xiphandrium monotrichum, Lw., July. Bonhill.
X. appendiculatum, Ztt., - - June—Sept. Bonhill.
X. fissum, Lw.,- - - - May—June. Bonhill.
**Syntormon tarsatus*, Fln., - July. Blairmore; Holy L.
S. pallipes, F., - - - - June—Sept. Gen. dist.
S. sulcipes, Mg., - - - June. Murroch Glen.
Medeterus apicalis, Ztt., - - July. Bonhill,
**Hydrophorus bisetus*, Lw., - July. Holy L.
**Liancalus virens*, Scop., - - May—Sept. Frankfield L.; Gorge of Avon; Bonhill. Mr. Malloch took a ♀ on 6th January last while sweeping.
**Campsicnemus scambus*, Fln., - Aug.—Sept. Gorge of Avon; Bishop L.; Bonhill.
C. curvipes, Fln., - - - C. and gen. dist. Occurs at all seasons.
**C. loripes*, Hal., - - - July—Sept. Bishop L.; Bonhill.
**Teucophorus spinigerellus*, Ztt., August. Murroch Glen.
Sympycnus annulipes, Mg., - July—Aug. Holy L.; Blairmore; Bonhill.
**Aphrosylus celtiber*, Hal., - July. Holy L.

Fam. Lonchopteridæ.

**Lonchoptera punctum*, Mg., - Sept. Possil M.
**L. flavicauda*, Mg., - - - Aug.—Sept. Gorge of Avon; Possil M.
**L. lacustris*, Mg., - - - Jan.—May and Sept. Gen. dist.
**Lonchoptera*, sp.? - - - March—May and Sept. Cadd. Wild.; Calderwood Glen; Dougalston (North) Wood, &c. I take this to be the species recorded now and again as *L. trilineata*, Ztt., but am doubtful about its identity.

Fam. PLATYPEZIDÆ.

**Opetia nigra*, Mg., - - - Aug.—Sept. Hawkhead Est.; Bonhill.

**Callimyia amœna*, Mg., - - One ♀, 3rd Sept, 1905, Stepps Wood.

***Platypeza atra*, Mg., - - One ♀, 22nd July, 1905, Bonhill.

Fam. PIPUNCULIDÆ.

**Chalarus spurius*, Fln., - - July—Aug. Bonhill.

**Verrallia aucta*, Fln., - - July. Benmore Est.; Bonhill.

***Pipunculus campestris*, Ltr., - June—Aug. Holy L.; Murroch Glen; Glen Massan; Helensburgh.

**P. confusus*, Verr., - - - June. Bonhill.

**P. hæmorrhoidalis*, Ztt., - - June. Inch Moan.

**P. xanthopus*, Thoms., - - August. Helensburgh.

Fam. SYRPHIDÆ.

**Pipizella virens*, F., - - June. Helensburgh.

P. flavitarsis, Mg., - - - July. Bonhill.

***Pipiza noctiluca*, L., - - June. Erskine; Bonhill.

***P. bimaculata*, Mg., - - June. Erskine.

**Cnemedon vitripennis*, Mg., - One ♂, 24th June, 1905. Gorge of Avon.

**Chrysogaster splendens*, Mg., - June—August. Bonhill.

**C. Macquarti*, Lw., - - - One ♂, 26th June, 1904. Hawkhead Est.

Chilosia sparsa, Lw., - - May. Gorge of Avon.

***C. pulchripes*, Lw., - - June. Bonhill.

C. variabilis, Pz., - - - June. Erskine.

**C. honesta*, Rnd., - - - May—June. Bonhill.

**C. vulpina*, Mg., - - - May. Gorge of Avon.

C. intonsa, Lw., - - - August. Possil M.

**C. grossa*, Fln., - - - One ♂, April, 1904. Bonhill.

**C. albipila*, Mg., - - - May—June. Bonhill.

C. albitarsis, Mg., - - - June. Cambuslang.

C. fraterna, Mg., - - - May. Bonhill.

***C. Bergenstammi*, Beck., - August. Bonhill.

**Platychirus tarsalis*, Schum, - April—May. Bonhill (*teste* Mr. P. H. Grimshaw).

Melanostoma scalare, F., - - May—Sept. Gen. dist.

**Melangyna quadrimaculata*, Verr., April. Bonhill.

***Ischyrosyrphus glaucius*, L., - August. Clober Dam.

I. laternarius, Müll., - - Sept. Bonhill.

***Syrphus albostriatus*, Fln., - June—July. Hawkhead; Benmore Est.

***S. tricinctus*, Fln., - - May. Cadder Wild.

***S. venustus*, Mg., - - - June. Erskine.

***S. lunulatus*, Mg., - - June—Sept. Bonhill.

S. annulatus, Ztt., - - - June. Bonhill.

***S. lineola*, Ztt., - - - May. Bonhill.

***S. vittiger*, Ztt., - - - June. Bonhill.

S. latifasciatus, Mcq., - - August. Helensburgh M.

S. luniger, Mg., - - - May—Sept. Gen. dist.

***S. bifasciatus*, F., - - - May—Aug. Hawkhead Est.; Clober Dam; Holy L.

S. cinctellus, Ztt., - - - May. Gorge of Avon.

S. cinctus, Fln., - - - June—July. Gorge of Avon; Bonhill.

***S. auricollis*, Mg.—
var. *maculicornis*, Ztt., - Sept. Helensburgh (B.H.).

S. punctulatus, Verr., - - May. Hawkhead Est.; South Bar; Cadder Wild.

***S. guttatus*, Fln., - - - June—July. Strone; com. in garden at Bonhill.

S. compositarum, Verr., - - Aug.—Sept. Bonhill.

**S. lasiophthalmus*, Ztt., - - April. Murroch Glen.

S. arcticus, Ztt., - - - May—August. Cadd. Wild.; Erskine; Bonhill.

Sphegina clunipes, Fln., - - July. Puck's Glen.

Ascia podagrica, F., - - - June. Castlemilk; Frankfield Loch.

***Helophilus trivittatus*, F., - One ♀, 12th July, 1905. Holy Loch.

H. hybridus, Lw., - - - August. Bonhill.

**H. transfugus*, L., - - - One ♀, 19th June, 1904. Frankfield Loch.

**Merodon equestris*, F.—
var. *narcissi*, F., - - June. Bonhill.
**Criorrhina berberina*, F., - June. Bonhill; Helensburgh (*teste* Mr. Malloch).
Xylota segnis, L., - - - June. Gorge of Avon.
**X. sylvarum*, L., - - - June—July. Hawkhead Est.; Bonhill.
**X. florum*, F., - - - July. Ardentinny.
Sericomyia lappona, L., - - June—July. Benmore Est.; Erskine (A.R.); Helensburgh (B.H.); Murroch Glen (J.R.M.)
Chrysotoxum arcuatum, L., - July. Bonhill.
C. bicinctum, L., - - - July. Benmore Est., Kilmun.

Fam. Conopidæ.

**Conops quadrifasciata*, Deg., - July—August. Bonhill.
Myopa buccata, L., - - - One ♂, 11th June, 1904. Erskine.

Fam. Tachinidæ.

**Gymnochæta viridis*, Fln., - May. Cadd. Wild.; South Bar.
**Epicampocera succinta*, Mg., - July. Holy Loch.
**Blepharidea vulgaris*, Fln., - Bred from pupa of *Pieris Napi*, Rutherglen (T. Wishart); emerged 26th May, 1902.
**Sisyropa hortulana*, Egg.— -
(?) *acronyctarum*, Mcq., - Bred from cocoons of *Saturnia carpini*, E. Kilbride; emerged 15th June—1st July.
S. lota, Mg., - - - - July—August. Murroch Glen; Dundonald Glen; Troon; Holy Loch.
**Melanota volvulus*, F., - - August. Bonhill.
**Hyalurgus lucida*, Mg., - - July. Holy Loch. Not unc. on heads of Water-Dropwort. This species was given in Mr. Verrall's 1888 list.

**Macquartia tenebricosa*, Mg., - July. Benmore Est.
**M. affinis*. Schin., - - - May. Bonhill (*teste* Mr. P. H. Grimshaw).
Olivieria lateralis, F., - - July—Aug. Blairmore; Troon.
**Micropalpus vulpinus*, Fln., - July—Sept. Stepps Wood; Holy L.
**Erigone radicum*, F., - - July—Aug. Blairmore; Cambuslang; Dundonald Gl.; Troon; Possil M.; Monkd. Cl.
**E. strenua*, Mg., - - - June. South Bar.
Plagia ruralis, Fln., - - August. Crookston.
**Rœselia antiqua*, Fln., - - July. Bonhill.
**Siphona cristata*, F., - - May—July. Hawkhead Est.; Blairmore; Calderwood Gl.; Erskine.
S. geniculata, Deg., - - - June—Sept. Gen. dist
**Trixa œstroidea*, Dsv., - - July. Holy L.; Benmore Est., Kilmun.
Cynomyia mortuorum, L., - August.—Sept. Monkd. Cl.; Troon; Possil M.
Sarcophaga carnaria, L., - - June—October. Gen. dist.
S. albiceps, Mg., - - - June—Aug. Gen. dist.
S. atropos, Mg., - - - Aug. Montgomery Est., near Troon.
**Metopia leucocephala*, Rossi, - June—August. Troon; Glen Massan.
Dexia vacua, Fln., - - - June—August. Troon; Colintraive; Glen Massan; Holy L.; Dundonald Glen.
**Myiocera carinifrons*, Fln., - July—August. Holy Loch; Murroch Glen.

Fam. Muscidæ.

**Stomoxys calcitrans*, L., - - June. South Bar; Frankfield.
Hæmatobia stimulans, Mg., - June. Lumloch, near Lenzie.
**Pollenio vespillo*, F., - - May and August. Bonhill.
P. rudis, F., - - - - March—October. C. and gen. dist.

Myiospila meditabunda, F., -	May—Sept. C. and gen. dist.
Graphomyia maculata, Scop., -	June—October. Gen. dist.
**Musca domestica*, L., - -	Jan.—Dec. C. and gen. dist. Seldom occurs away from houses.
Cyrtoneura stabulans, Fln., -	Aug.—Sept. Bridgeton; Dennistoun. Within doors.
**C. pabulorum*, Fln., - -	April. Bonhill (*teste* Mr. P. H. Grimshaw).
Morellia simplex, Lw., - -	June—Oct. C. and gen. dist.
M. hortorum, Fln., - - -	June—Oct. C. and gen. dist.
**M. curvipes*, Mcq., - - -	June. Bonhill (*teste* Mr. P. H. Grimshaw).
Mesembrina meridiana, L., -	July—Sept. Gen. dist.
Protocalliphora grœnlandica, Ztt.,	May—Oct. Gen. dist. Not c.
Calliphora vomitoria, L., - -	May—Sept. Gen. dist.
**Lucilia sylvarum*, Mg., - -	June—July. Crookston; Possil M.; Ardentinny.
L. sericata, Mg., - - -	May—July. Murroch Glen (J.R.M. and R.H.).
**L. nobilis*, Mg., - - -	One ♀, 15th June, 1901, Rowardennan.

Appleringie, *Artemisia Abrotonum*, Linn.

By R. S. Wishart, M.A.

[Read 26th December, 1905.]

It was a little stalk, dry and withered. Its leaves were pressed together, and the whole had become hard and brittle. How long it had lain between the leaves of an old, well-worn, hump-backed copy of the New Testament nobody can tell, for this book has been handed down through several generations. But the tiny specimen, now only a semblance of its former self, is enough to awaken a new interest and to recall old memories of this always interesting plant. The custom of carrying bits to church and placing them in the Bible or Psalm-book is well known. It is believed that this custom may have arisen from the habit of

keeping strong-smelling herbs or leaves near at hand as a supposed preventative or charm against disease. But, whatever may have been its origin, most people are satisfied with the thought that it helps to sustain drowsy listeners when the circumstances are trying.

Our present interest is to notice how the custom of using this plant as a church flower has followed it, and how both this custom and the plant's immigration to Scotland have to do with tracing the evolution of the name Appleringie.

If we had been brought up in a French village, instead of in some corner of the British Isles, we would have seen how naturally our mothers and aunts, on starting for church, walked into the garden and plucked a handful of the sweet-smelling plant. The customs in France and Scotland are so much alike as to suggest, even without knowing anything more, that the one may have been borrowed from the other.

Appleringie, Apleringie, or Aipleringie—spell it as you please—is the Scotch name of the plant which in English is called Southernwood, and whose scientific name is *Artemisia Abrotonum*, Linn. Scotch people do not need to be told that the "g" is pronounced hard, as in "ring," and that the first part of the word is usually pronounced as in the third spelling just given.

What we read of any plant in early times has usually reference only to its economic value. Many are mentioned solely on account of their supposed medicinal virtues, and among these the Appleringie takes an important place. Its Latin name is *Abrotonum*, which in turn is derived from the Greek privative prefix *α* and *βροτός*, mortal, meaning that it had great power in saving from death. Horace says of it—

> "Navim agere ignarus navis timet; abrotonum ægro
> Non audet, nisi qui didicit, dare."

Pliny extols its virtues and enumerates twenty-two ailments which could be cured by the plant, and Culpepper and hosts of herbalists have followed suit in later generations. Indeed, its healing virtues, as believed in at different times, have been so numerous as to make it appear worthy of getting the West Coast Highlander's tribute to *his* cure transferred to it—"I wouldna like to be ill wi' what whisky wouldna cure!" The disagreeable taste would help in strengthening confidence as to the plant's

curative properties. Many of us remember that in our childhood an idea seemed to prevail that whatever was bitter or nauseous was good for children, so that infusions of bog bean, ferns, myrtle, chamomile, barberry, Turkey-rhubarb root, and the like, might at any time be safely administered; while jams, jellies, fruits, and other things pleasant to the palate had always a certain amount of danger connected with them. I never actually saw Appleringie, however, used as a medicine; its pleasant smell must have saved it, in the mistaken belief that its taste was pleasant too.

The derivation of the Scotch name, Appleringie, frequently turns up as a puzzle. Nobody needs to be told that it has nothing to do with apples. Any attempts to settle the derivation on the basis of "ring" and the Scotch diminutive "ringie" need not be taken seriously. The fact is, to enunciate at once the theory which I mean to submit, Appleringie signifies the immortal plant—that is, the plant which saves from death—although the name is not only used but has actually been evolved without attaching any such meaning to it. It has descended "by ordinary generation" from the two Greek words already quoted, or, which is the same thing, *ἀβρότονον*, the Greek name for the plant. It is easy to see that *Abrotonum* is simply the Latin form of the same word, and it was applied in both cases from a genuine belief in its virtues. But in order to understand exactly how the Scottish name arose, we must consider for a little how the plant reached us itself, and what modifications of its name it assumed on its way hither.

Our plant is not a native of this country, but it is cultivated in every cottage garden. In Scotland it has only a few poor relations growing wild—wormwood, absinth, and the sea-side artemisia—all of which are being exhibited to-night. The last has a considerable resemblance to the Appleringie, both in appearance and smell, but its leaves have a hoary whiteness all over and its branches are straggling instead of upright.

France and the South of Europe generally claim the Appleringie as a native. In an old edition of the "Hortus Kewensis," which I have before me, the plant is said to have been introduced into Britain about the year 1548, and Loudon also gives the same date. It was, therefore, unknown in this country before

the time of Mary Queen of Scots, and, according to the best authorities we can find, it was introduced during her reign. And, as we know that there was a good deal of coming and going between France and Scotland in Mary's time, it is reasonable to assume that the plant came from France to us.

Now, the name passed from the Greek through the Latin to the French in this way. *Abrotonum* became in old French,* *abroigne*, and then *avroigne*, and these gave place to the modern French name, *aurone*. One of the best-known attempts to derive the name Appleringie from this is that found in Dr. Jamieson's Scottish Dictionary, in which the derivation is said to be from the French "*apilé*, strong, and *aurone*." This looks feasible as far as sound goes, but it will not do for various reasons, chiefly because *apilé* is not a French word at all, nor does there appear to be any similar French word meaning "strong" that it could have been mistaken for. Had he said *epilé*, and taken it to mean "without hairs," he might have been reasoned with, because the plant is less hairy than some of the other species. *Glabre*, however, is the French word in constant use in this sense, and I am not aware of *epilé* being ever so used regarding plants. This word would rather signify that the hairs had been taken off. But another fatal objection is that a Frenchman would not say *epilé aurone*, but *aurone epilé*, which entirely defeats Dr. Jamieson's theory, whether we take *epilé*, *apilé*, or any such word to represent the "apple" in Appleringie.

Any attempts which I have ever seen to trace the derivation of our Scotch name through the French have entirely failed, or been insufficient, mainly on account of the omission of two important links. These are found in the northern provincial French and the Aberdeenshire names, both of which are still in use. In drifting into corruptions, there is often a tendency to alight upon some form of word that means, or seems to mean, something. Of this we have examples in gillyflower and jelly-flower, from *giroflée*, and Jerusalem, in the name Jerusalem artichoke, from *girosole*, a name of the sunflower, while in neither case is there any connection with jelly or Jerusalem. In the same way, in France the word *aurone*, after perhaps passing through various shapes and sounds, settled down into the

* Amour's "Scottish Alliterative Poems," pp. 374-375.

present provincial form of *ivrogne*, which means a drunken man. Better have some meaning than none at all.

Now comes the important step by which the name reached Scotland. If it is a reasonable assumption that the plant was introduced from France in the time of Queen Mary, it is also fair to assume that French people brought it and called it by their own name, *ivrogne*. We have all our troubles in pronouncing French to the satisfaction of a native, and is it any wonder that this name, after being used or attempted for a while in North-Eastern Scotland, should have become "iveringie" and "overingie"? These names are both common in Aberdeenshire still, and, in fact, they are both the same, for on the East Coast, north of the Tay, "over" as a prefix is usually pronounced "iver;" for example, "Overtown" is "Ivertown," and "Overgate" is "Ivergate." The provincial French and the Aberdeen names are so much alike that this step across the channel scarcely needs confirmation, but a parallel may be instanced in the everyday Aberdeen word "rooser," which is clearly from the French *arrosoir:* either name is more convenient than "watering-pan."

When Central and Southern Scotland got hold of the name, they began to move backwards another step towards the original "ab," and, with the same laudable intention of giving the term a meaning, gradually converted overingie into Appleringie. It will be observed, on examining the words in their historical succession, that after *aurone* was reached the tendency has been to go back by the same course from the "u" through the "v" to the "ab" or "ap." To see the changes properly, it is necessary to look at the whole together, arranged in historical order:—

Ἀβρότονον,	- -	Greek.
Abrotonum,	- -	Latin.
Abroigne, Avroigne,	- -	Old French.
Aurone,	- - -	Modern French.
Ivrogne,	- - -	Provincial French.
Iveringie, Overingie,	- -	Aberdeenshire.
Apleringie, Appleringie,	- -	Common Scotch.

One of the German names of the plant is also a branch of the same family of words, and it, too, shows a tendency to drift into some similarly sounding word, in order to have the appearance of a meaning. The name arrived at in any particular language need have no connection with the plant, but depends upon some word in that language being similar in sound to the original Greek or Latin name. In German the two forms, *aberraute* and *eberraute*, easily come in succession from *abrotonum;* the former may mean another or a second rue, and the latter, the boar-rue. So, from mere accidents in the respective languages, different nations make the same original word appear to mean very different things: the Germans connect the "immortal plant" with rue and a boar, the French with a drunkard, and the Scotch with an apple.

The English name, "Southernwood," comes from quite a different source. According to Dr. Prior, it is "abridged from *souderne wermod*, southern wormwood," and, being of Anglo-Saxon origin, it can only be associated with dead dried plants brought into the country for medicinal purposes, and has no connection with the living plant, and neither part nor lot with Appleringie and its long line of progenitors.

Occurrence of *Gonactinia prolifera*, Sars, in the Firth of Clyde.

By E. S. Russell.

[Read 26th December, 1905.]

It was my fortune to dredge this curious little Actinian at Castle Bay, Little Cumbrae, on 15th June, 1905. As Gonactinia is very rare in British waters—this being only the second record—some interest attaches to it on that account. But Gonactinia is also remarkable for its peculiarities of structure and habit, and it may not be out of place to give here a short account of these, in addition to a notice of its distribution.

Distribution.

Gonactinia prolifera was discovered in 1835 by M. Sars (1), in the neighbourhood of Bergen. He named it at that time *Actinia prolifera.* In 1851 he recorded it from Tromsoe and Hammerfest (2), and founded the genus Gonactinia for it. Two further Norwegian records were made by Koren (3), and by Blochmann and Hilger (4). Then, in 1891, it was recorded from the Mediterranean by Prouho (5), and finally, in 1896, from Falmouth by Vallentin (6). Mr. S. Pace informs me that it probably occurs at Plymouth, but that there are no definite records of its discovery there. According to Delage and Hérouard (7), Gonactinia is found at Noumea, on dead coral, but I have not been able to trace this record.

The exact localities are as follows:—

Norway.—(*a*) Bergensfiord, Giesvaer, and Floroe. Not uncommon on weed, Sertularians, and Ascidians. (Sars, 1.)

(*b*) Tromsoe, 10-20 fms., among nullipores. Hammerfest, 10-20 fms., very common on Delesseria. (Sars, 2.)

(*c*) Neighbourhood of Bergen, 10-30 fms., along with *Edwardsia tuberculata.* (Koren, 3.)

(*d*) Island of Fladholmen, near Bergen, 2-3 fms., common on shells, dead or living, of Modiolaria, in company with *Eudendrium capillare* Alder. (Blochmann u. Hilger, 4.)

Mediterranean.—Coasts of Roussillon, 43 fms. (Prouho, 5.)

Britain.—Falmouth. (Vallentin, 6.)

To these I have now to add my Cumbrae record. *Gonactinia prolifera* was found at Castle Bay, Little Cumbrae, in a depth of 15-20 fms., attached to the tubes of the worm *Chaetopterus insignis.*

Looking at these records we see that Gonactinia is to be found in all depths from two to about forty fathoms. Also it seems to occur on all sorts of surfaces—on weeds, nullipores, Sertularians, Ascidians, shells of Modiolaria, tubes of Chaetopterus. There are mentioned as occasionally associated with Gonactinia, the anemone *Edwardsia tuberculata,* and the hydroid *Eudendrium capillare;* but these associations are evidently merely accidental. Blochmann and Hilger (4) obtained ripe individuals in the middle of October.

Characteristics.

Gonactinia is one of the primitive anemones, resembling in structure Edwardsia, which is now generally considered to be the simplest and most generalised type of Actinian which exists at the present day.

Gonactinia is a small, reddish anemone, about 2-3 mm. in length and 1-2 mm. in breadth. It has sixteen non-retractile tentacles, in two rows, and also sixteen mesenteries, of which eight are macromesenteries. Four of these latter bear gonads.

Gonactinia has the power, quite exceptional among Actinians, of reproduction by transverse division. A circlet of tentacles buds out about the middle of the column, and a constriction is formed just above. The anemone is then divided by this constriction into two segments, and both of these segments form new individuals. The lower segment developes a stomodaeum only after it has become separate from the upper. The whole process resembles the strobilisation of the scyphistoma among the Discomedusae.

Gonactinia sometimes exhibits lateral budding (4), or even longitudinal division (5), but the latter process is abnormal. Sexual reproduction is also found in Gonactinia.

Some have considered Gonactinia to be merely the young of such a form as *Anthea cereus*, but such a view is controverted by the fact that the ripe sexual elements have been observed.

Gonactinia has little power of adhesion, and is easily detached from its point of support. Prouho (5) has observed that it has the power of swimming. It swims head foremost, by means of bending and stretching its tentacles in rapid rhythm. Sars (1) notes another mode of progression. It can move along after the manner of a "looper" caterpillar. Bending over, it takes hold of the surface of attachment with its tentacles, and shifts its foot close up to the tentacles; then it fixes its tentacles anew, further over, and again drags its foot along. In this way it is able to crawl in any direction. The original description of *Gonactinia prolifera* by Sars (1), which is not readily accessible, is translated by Blochmann and Hilger in their paper on Gonactinia (4). They furnish also a specific diagnosis of their own.

References.

1. Sars, M.—Beskrivelser og Jagtagelser over nogle moerkelige eller nyt i Havet ved den Bergenske Kyst levende Dyr, p. 11. Bergen, 1835.
2. Sars, M.—Nyt. Mag. f. Naturvidensk, vi. (1851), p. 142.
3. Koren, .—Nyt. Mag. f. Naturvidensk, ix. (1859), p. 93.
4. Blochmann, F. u. Hilger, C.—Morph. Jahrb., xiii. (1888), p. 385, pl. 14-15.
5. Prouho, H.—Arch. zool. exp., sér. 2, tome 9 (1891), p. 247, pl. 9.
6. Vallentin, R.—Journ. Inst. Cornwall, xiii. (1896), p. 43.
7. Delage et Hérouard.—Traité de Zoologie Concrète. Tome ii., pte. 2 (1900), p. 494.

Meteorological Notes and Remarks upon the Weather during the Year 1905, with its General Effects upon Vegetation.

By James Whitton, Superintendent of Parks, Glasgow.

[Read 30th October, 1906.]

In order to preserve the continuity of the series, these notes have been compiled, as in former years, from the records kept at Queen's Park, Glasgow.

January.—The genial, mild weather which ushered in the new year continued during the week. From the 4th to the 16th the weather was stormy and unsettled, with frequent heavy showers of rain and sleet, accompanied by cold, high winds. Thereafter, until the end of the month, it was drier and more bracing, though the afternoon of the 30th was wet and stormy.

The atmospheric pressure was wide in range and erratic in course. On the 1st the barometer indicated 30·30 inches, then a steady fall to 29·15 inches on the 6th occurred, when a gale with heavy showers was experienced. For a week thereafter the pressure was higher but very irregular, then another sharp fall from 30·10 on the 13th to 28·70 inches on the 17th was noted,

when another gale of some severity was experienced. For some days thereafter, though erratic, the tendency was upward, and on the 28th and 29th it was at 30·50 inches, falling sharply again prior to the gale on the afternoon of the 30th.

The rainfall was much below the average, only 1·78 inch being registered, compared with 3·93 inches in 1904 and 7·04 inches in 1903. There were 15 dry days.

The open character of the weather is well shown by the low amount of frost registered, only a total of 33° on 9 days, compared with 28° on 8 days in January, 1904, and 115° on 13 days in 1903.

Regarding the temperature, the general similarity of conditions with those of January, 1904, is shown by the averages being alike, viz., maximum 43° and minimum 35°, whereas, comparing again with 1903, these figures are 4° higher respectively.

Consequent on the open weather, grass lands were remarkably green, and buds on trees and shrubs with a tendency to early growth were somewhat prominent.

February.—The first few days were cold, with heavy showers of snow and sleety rain. Becoming drier, the weather was more pleasant for a week, when it again got cold and stormy, with sleet on the 10th, and a sharp touch of frost, with showers of snow, on the 12th. A very varied week followed, the early part being fine and bright and the latter changeable, with gusty winds and heavy showers, culminating in a wild storm, accompanied by thunder and lightning, on the 18th and 19th. With sharp touches of frost in the mornings, the days were bright until the 25th, on which date there was a slight fall of snow. The remaining days were variable with rain.

During the first half of the month the atmospheric pressure, though a little irregular, was within moderate range—between 29·45 and 30·25 inches. The latter half was characterised by sharp changes and an extremely wide range. From 30·25 inches on the 14th the pressure fell to 29·35 inches on the 19th. A sharp rise followed, and on the 22nd 30·45 inches was indicated. This was followed by a very sharp fall to 28·55 inches on the 27th, nearly two inches of difference in five days.

The amount of frost registered was comparatively trifling, only amounting to 35°, occurring on 11 days. The absence of severe

frost and the low rainfall contributed to the high average temperature, the maximum being 45° and the minimum 34°, compared with 41° and 32° respectively in February, 1904.

The rainfall (2·51 inches) was again low for the month, and not much over what was registered for February, 1904, when the amount was 2·28 inches.

With the abnormally open weather, vegetation began to move, and the buds on many deciduous trees and shrubs swelled considerably. *Rhododendron præcox* and *R. nobleanum* were open by the middle of the month, but got frosted on the 22nd. Snowdrops were in full bloom during the early weeks, and *Daphne mezereum* about the 25th.

March.—The weather during this month was of a very variable character—rain falling nearly every day; but frequently occurring at night or early morning, the day-time was often bright and fine, especially so for the season of the year. The notable exceptions were on the 9th, which was a wild wintry day, with heavy showers of snow, which melted as it fell. A sharp, severe gale, with rain, occurred on the 15th. On the 22nd a dense fog overhung the city until 11 a.m., the afternoon being fine and bright.

The variableness of the weather is well shown by the erratic barometric readings. On the 1st the pressure indicated was 29·15 inches, by the 3rd it was at 30·00 inches, which was the highest point touched during the month. The fall was steady, though erratic, till the 15th, when it was down to 28·20 inches, which proved to be the lowest reading of the year. The rise was rapid and regular for 4 days, as on the 19th it was up to 29·70 inches, keeping fairly regular within a few points of that figure until the end of the month. Although there were only 6 dry days, the rainfall was just about the average—the amount registered being 3·16 inches. In March, 1904, the amount was 1·43 inches, which, however, was abnormally below the average for this month.

There was a notable absence of frost, as only 1° was registered, compared with 61° on fifteen occasions in March, 1904. Consequently, the average temperatures are high. The maximum being 49° and the minimum 37°, in each case 5° higher than for the corresponding month of the preceding year.

The absence of frost and the showery nature of the weather encouraged vegetation, which was fully a fortnight in advance of ordinary seasons. Rarely have the grass fields been so bright and fresh in March.

April. — For the first few days the conditions which characterised March continued. With a change of the wind to the north-west the weather got cold and frosty, and a fall of snow to the depth of about three inches occurred on the 7th. For fully a fortnight thereafter the weather, though frequently bright, was cold, owing to the easterly winds and touches of frost. On the 26th the wind again settled into the south-west, and the closing days of the month were mild and showery.

The range of the barometric readings was within one inch—between 29·10 and 30·00 inches—and no specially notable fluctuations in the pressure were recorded.

The rainfall was low, as only 1·79 inch was recorded, and there were fifteen dry days. This is in marked contrast with April, 1904, with 4·64 inches and only six dry days.

Frost, amounting to 30°, was registered on ten mornings, the coldest morning being the 8th, when there were 9°. The average maximum temperature was 51°, and the minimum 36°, or 1° and 6° lower than those of April, 1904.

The cold dry weather materially checked the abnormally early vegetation. Many plants had their tender young growth injured by the sharp frost on the 8th. Fortunately the growth of the major portion of our trees and shrubs was not sufficiently advanced, and though checked in development they were not materially injured. Towards the end of the month, with the renewal of mild weather, there was a notable bursting into bloom of certain varieties of rhododendron, and the variety "Jacksoni" was exceptionally good. Narcissi were in bloom when the snowfall occurred, but did not suffer much from the change of temperature. Towards the end of month Hyacinths and Tulips developed rapidly.

May.—The first week was somewhat changeable, with occasional showers. Thereafter the weather got drier and warmer, although some days were cold on account of the keen piercing easterly winds. These conditions prevailed until the

25th, when a change occurred, and the last week of the month was distinguished by weather of a soft mild nature.

These conditions are well shown by the record of the atmospheric pressure, which on the 1st was at 28·90 inches. From that point it steadily rose until on the 5th it reached 30·20 inches. It varied little between that point and 29·70 inches during the remainder of the month.

The rainfall was again below the average, and only 1·67 inch was registered. Of that amount 1·21 inch fell between the 24th and 30th. There were seventeen dry days. In May, 1904, the rainfall amounted to 3·36 inches, and there were fourteen dry days. Although no frost was registered during the month, the radiating thermometer on the grass was at or below freezing point on fifteen occasions. The lowest reading of the thermometer in shade was 33°. The average maximum temperature was 58°, and the average minimum 44°, or 2° and 1° higher respectively than those of the corresponding month of 1904.

While the dry hard weather had a deterrent effect on the rapid growth of many trees and shrubs, the absence of frosts and destructive gales, which was frequently experienced, allowed the development of the foliage of such trees as Chestnuts and Sycamores to proceed unchecked, and with the warm showery days at the close of the month the growth was magical. The Oak leafed on the 13th, and the Ash on the 21st. Deciduous trees and shrubs bloomed exceedingly well, and some Rhododendrons, notably R. *Cunninghami*, were exceedingly floriferous.

June.—The genial mild weather which was experienced during the latter days of May continued for a few days during the first week. With the wind changing to the east, and continuing from that quarter, there was for fully a fortnight a spell of dry cold weather with bright sunshine. A change occurred on the 18th, when the wind veered to the south-west, and for four days it was showery and unsettled. Thereafter, until the end of the month, warm, delightful weather prevailed.

During the first nine days the atmospheric pressure tended upwards, reaching 30·00 inches on the 8th and 9th. For ten days thereafter there was a gradual decline, and on the 20th the barometer indicated 29·40 inches, when a squally day of rain and

wind was experienced. The pressure rapidly increased, and on the 25th it stood at 30·30 inches. From that point it as rapidly fell to 29·60 inches on 28th and 29th, with a rise of two points on the 30th.

The dryness of the weather is well indicated by the abnormally low rainfall, which was only 0·82. There were twenty-two dry days. In June, 1904, the rainfall was 1·54 inch, and there were seventeen dry days.

Despite the cold easterly winds the average temperature was fairly high, the maximum being 64° and the minimum 50° respectively, 2° higher than in June, 1904, when the thermometer in the shade was above 70° on 4 days, whereas in the month under notice that point was reached on seven occasions—from the 23rd to 30th—the warmest day being the 26th, when the maximum thermometer indicated 77°.

The drying winds and bright sunshine adversely affected all newly-planted trees and shrubs, and somewhat hindered the development of established plants, which otherwise looked well. The bloom on trees and shrubs passed off quickly, and border plants and annual crops languished for want of moisture.

July.—Although somewhat more showery, there was a continuance of the genial weather which characterised the latter part of June. These conditions prevailed throughout the month. Though rain fell frequently during the month, no day was wet throughout, and many days were delightfully pleasant. A thunderstorm occurred on the 9th.

These conditions are well indicated by the even course of the atmospheric pressure, which also, considering the occasional rains, was of narrow range between 29·50 and 30·00 inches. Only on one occasion was it above that point, when on the 19th it touched 30·10 inches.

The outstanding feature, however, is in regard to the temperature, which throughout was high. The maximum thermometer in shade was only on one occasion below 60°, while it was above 70° on eleven days—the highest reading being 78°, occurring on the 10th and 11th. The night temperature was likewise high, never being lower than 45°, and only five times below 50° and three times 60° and upwards. Consequently the averages are

high, the maximum being 67° and the minimum 53°, against 64° and 51° respectively for July, 1904.

The rainfall was 2·81 inches, of which 0·52 inch fell on the 22nd, and there were 12 dry days. In July, 1904, the rainfall was 3·80 inches, with 14 dry days.

With the showery weather and warm temperature, vegetation quickly made good the leeway caused by the drying winds of June, while the growth was satisfactory in every respect. The foliage of trees being better and cleaner than usual in the vicinity of the city.

August.—During the early days of the month the weather was somewhat showery, with a severe thunderstorm and heavy rain on the 4th. Thereafter, with the shortening days, the weather, though generally fine, began to get cooler, and the first hazy morning of autumn was on the 15th. The latter half of the month was variable, with several dull days near the close.

The barometric readings show that the atmospheric pressure was very irregular during the month. From 29·60 inches on the 1st it sharply dropped to 29·10 inches on the 4th, when the thunderstorm noted occurred. On the 6th it was up to 29·70 inches, and kept up with slight variations till on the 14th and 16th it was at 30·00 inches. A rapid fall followed until the 19th, when it was at 29·30 inches. Rising from that point the course was irregular for a week, then rising sharply to 30·05 inches on the 31st.

The rainfall amounted to 3·61 inches, and there were twelve dry days; these figures being almost similar to those of August, 1904, which were 3·49 inches and twelve dry days.

Regarding the temperature, though the maximum in shade was at or above 60° on twenty-six days, on no occasion did it reach 70°, consequently the averages are low, the maximum being 62° and the minimum 50°, compared with 63° and 52° respectively for August, 1904.

While the development of crops was good and steady, and cereals began to ripen about the middle of the month, harvesting operations were much hindered by the showery, mild weather. Towards the end of the month the signs of autumn were in evidence in the city parks by the rapid defoliation of such trees as Limes, Sycamores, and Elms.

September.—The changeable weather which prevailed in the latter days of August continued during the first fortnight. High winds were somewhat frequent, and showers daily. The 6th was very wet after mid forenoon. The latter half of the month was almost ideally fine for harvesting, with bracing winds and very few showers. The 25th (Glasgow Autumn Holiday), was a delightful day for the holiday-makers.

During the prevalence of the showery, windy weather of the first fortnight, the barometer readings were low and irregular for the season. On the 1st the atmospheric pressure was 29·90 inches, and it was down to 29·10 inches on the 7th and 10th. A sharp rise followed to 30·10 inches on the 14th; with slight variations that point was also reached on the 17th and 21st. A slight and steady decline followed to 29·65 inches on the 27th, after which the pressure increased with the closing days of the month.

Of the rainfall, 2·11 inches, 0·52 inch was registered on the morning of the 7th. There were twelve dry days. In September, 1904, the rainfall amounted to 2·73 inches, and there were seventeen dry days in the month.

Regarding the temperature, it, like the rainfall, was almost similar to what was experienced in the preceding September, as the averages are almost identical, viz.:—58° for the maximum and 56° for the minimum. The former being 1° less and the latter the same as those of the previous year. No frost was recorded, though the radiating thermometer on surface of grass was below freezing point on seven mornings.

While the stormy, changeable weather at beginning of month hindered harvesting operations, the fine conditions which prevailed later were specially favourable for such work, and the fields generally were cleared of grain, and in some parts ploughing begun, by the end of the month. The defoliation of trees was very marked in the neighbourhood of the city, many being quite bare.

October.—Opening fine, with the wind in the north-west, there was a sudden change of the wind to the south-east on the 3rd, and heavy rain set in, which continued until the following morning. The weather continued changeable and stormy for several days; then a short spell of fine weather followed, which

was succeeded by several dull cold days with heavy showers. On the 16th, with the wind northerly, the first sharp frost of the season occurred.

For several days the frosts continued, accompanied by fogs in the city in the mornings. The dry weather continued until the 26th, after which it was more or less rainy till end of month.

The changeable character of the weather is well shown by the wide and erratic range of the barometric readings. On the 1st the atmospheric pressure was at 29·65 inches and 29·70 inches on the 3rd. A sudden drop to 28·90 inches occurred on the 4th, which was succeeded by as quick a recovery to 29·90 inches on the 5th. There was a gradual rise, and 30·30 inches was recorded on the 10th and 11th. From that point there was a sharp decline, and 29·30 inches was indicated on the 15th. The following day the pressure was up five points, and kept within a range of half an inch until the 29th when, from 29·80 inches, it suddenly fell to 28·90 inches, and kept at that point on the 30th and 31st.

With eighteen dry days in the month, there was a rainfall of 2·57 inches. On four days the amount was over a quarter of an inch; the greatest for twenty-four hours was 0·71 inch, registered on the morning of the 4th. In October, 1904, the rainfall was 2·12 inches, with eleven dry days.

Frost, amounting to 57°, was noted in the mornings. This, with the cold winds, tended to keep the temperature down—hence the averages are low, the maximum being 50° and the minimum 36°, compared with 54° and 43° respectively for October, 1904.

The frosts finished the season so far as tender plants were concerned. The most notable damage in our parks and gardens was the ruin of the early outdoor chrysanthemums, which, despite the good summer, were later in flowering than usual, and were just coming to their best when caught by the frost, which utterly spoiled what promised to be a grand display. The frost also completed the defoliation of deciduous trees.

November.—The changeable, rainy weather which prevailed during the last week of October continued until the middle of month, only three days in that time being without rain. A week of dry frosty weather followed, and dense fogs hung over the city during the prevalence of the frost. A change set in on the 21st,

and the 22nd was wet, with a gale at night. Until the end of the month the weather was changeable, with heavy rain nearly every day.

As might be expected, the atmospheric pressure was very irregular and somewhat wide in range. From 29·10 inches on the 1st it dropped to 28·90 inches on the 2nd, sharply rising to 29·50 inches on the 4th, and falling to 29·00 inches on the 6th. Then another quick rise took place, as on the 9th, it was at 29·90 inches. This was followed by as quick a fall to 29·00 inches on the 11th, after which there was a more steady rise to 30·00 inches on the 18th, somewhat irregularly falling thereafter to 28·70 inches on the 26th, then rising sharply to 29·80 inches on the 29th, falling four points on the last day of the month.

The rainfall amounted to 3·29 inches, and there were ten dry days. In November, 1904, the rainfall was 2·07 inches, with fifteen dry days.

Regarding the temperature there were nine days on which frost occurred, to the amount in all of 54°, and on two days the thermometer did not rise above freezing point (32° Fahr.). Consequently the averages are again low, the maximum being 44° and the minimum 35°, or 3° and 2° lower respectively than those of November, 1904.

While the weather conditions were exceedingly depressing, there was a freshness on grass lands unusual for the season. The excessive wet, however, hampered outdoor work to a considerable extent.

December.—At the beginning there were a few fine mild days, which were followed by several wet stormy ones, during which a considerable amount of rain fell. A sharp touch of frost occurred on the 12th, and until the 23rd, which, however, was bright and sunny, the weather was dull and mild. The 24th was very wet, after which, with the wind easterly, another spell of frost set in on the 27th, and the closing days of the year were somewhat cold.

The barometric readings were wide in range, and for a time unusually high for the season. With an upward tendency on the 1st, the pressure was at 30·00 inches on the 3rd. A sharp fall to 29·20 inches on the 6th was followed by an equally sharp rise to 30·30 inches on the 10th. The day following the pressure eased

plants—there was a steady development as the days lengthened, and on the whole the growth made by trees was satisfactory, and the foliage generally was better developed than in most years. Deciduous trees and shrubs bloomed well as a whole, but the display was of short duration, on account of the dryness of the atmosphere and prevalence of keen winds during the period of bloom. This drying effect, which intensified the natural exhaustion consequent on the heavy flowering of plants, caused the trees to "set" badly, therefore the crops of fruit were below the average.

Grass lands were slow to start, but made good headway after the beginning of June, and hay crops generally were good. Cereals were also a full crop, and were harvested on the whole in excellent condition. Root crops, especially potatoes, were above the average. The growth made by trees and shrubs, as already stated, was good, and, getting rain in time in autumn, most species set flower buds very freely, and the promise of an excellent display of bloom for 1906 is extremely satisfactory.

On the occurrence of *Idothea neglecta*, G. O. Sars, and *Idothea viridis* (Slabber), within the Clyde Sea Area, and some Notes on other Clyde species of Idothea.

By Alexander Patience.

[Read 26th September, 1905.]

The family Idotheidae, to which the above-named species belong, forms part of the Valvifera, a tribe of the great order Isopoda. This important group is distinguished from all other known Isopoda by the peculiar structure of the uropods, which have become modified so as to act like a pair of folding doors over the under surface of the metasome, thus protecting the delicate pleopoda, or swimming feet.

The six species belonging to this family recorded by Dr. Thomas Scott, F.L.S., from the Firth of Clyde in 1901 are:—*Idothea baltica* (Pallas); *I. pelagica*, Leach; *I. emarginata* (Fabr.); *I. linearis* (Pennant); *Zenobiana prismatica*, Risso; and *Stenosoma acuminata* (Leach).*

During some recent dredging cruises on the steam yacht "Mermaid," of the Millport Marine Biological Association, I collected at several localities quite a large number of specimens, representing several of the species of this family. Upon examination, I found a number of these specimens to agree with the description and figures, by Professor G. O. Sars, of the two species, *Idothea neglecta*, G. O. Sars, and *I. viridis* (Slabber).†

These species have not yet apparently been recorded from the Firth of Clyde, nor probably from the British seas.

Idothea neglecta in some respects resembles not only *I. emarginata*, but also *I. baltica*, and doubtless has been passed over by former observers as belonging to the latter species. Sars observes, "there cannot be any doubt that this very common form must have been observed by several authors. It has not yet been recognised as a distinct species, but has either been regarded as merely a variety of *I. baltica*, or as *I. pelagica* of Leach."‡ There is little doubt, however, as to the distinctness of the species.

While it agrees with *I. baltica* in having the coxal plates contiguous, which form, as in that species, a broad marginal area, it differs principally in the structure of the stylets of the second pair of pleopoda of the male, which are much shorter and do not reach much beyond the middle of the inner plate, whereas in *I. baltica* they reach almost to the end of the inner plate, and in the terminal segment of the metasome, which is slightly narrowed distally and terminates in a blunt point, the lateral corners being rounded off, whilst in *I. baltica* it has a distinctly tridentate form.

The largest male specimen in my collection measures 35 millemetres.

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* Hand Book of Natural History, British Assoc. Mg., Glasgow, 1901.

† Crustacea of Norway, Vol. II., Isopoda, pp. 83-85, pls. 34-35.

‡ Op. cit. p. 84.

Occurrence.—S. of Little Cumbrae, 14 fms.; off Alans, Cumbrae, 10 fms.; off Aoidh Rock, Loch Fyne, 21 fms.; near East Loch Tarbert, 16 fms.; Lamlash Bay, near King's Cross, 6-8 fms.; Kilbrannan Sound, near Campbeltown, 18 fms. (S. of Otterard Rock); Garrison Bay, Millport, 2-3 fms.

Idothea viridis is a much smaller and slenderer species, oblong linear in form. Without close examination it might be passed over as the young of *I. baltica*, as the termination of the last segment of the metasome somewhat resembles that species, but the median prominence is much blunter, and the lateral corners are obtuse; the coxal plates are not contiguous as in *I. baltica*, and are comparatively much smaller; the inferior antennæ are comparatively much longer and more slender, and the stylets of the second pair of pleopoda in the male extend considerably beyond the inner plate.

Colour dark green, some specimens exhibiting a pale grey band on the median line, extending from the middle of the cephalon to the tip of the last segment of the metasome. Females bearing ova in June, July, and August. Length of male, 10 mm.

Occurrence.—Millport Bay, l.w.; off Little Cumbrae, 8 fms.; Ettrick Bay, 7 fms.; Minard Bay, 2-3 fms.; Lamlash Bay, 4-5 fms.*

I have been allowed to examine some specimens contained in a tube in the Millport Marine Biological Station, belonging to the "Robertson" collection, and marked "*Idotea acuminata*, Leach." These are, however, referable to *I. viridis* (Slabber). *I. acuminata* has now been transferred to a different genus "in which all the segments of the pleon are dorsally fused, and form a single piece." The late Dr. Robertson records this species as having been taken by him in the Clyde, and Bate and Westwood refer as having received specimens from that distinguished naturalist,† but in view of what I have stated above,

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* Since the above was read, my friend, Dr. Alex. Frew, of Glasgow, has drawn my attention to the occurrence of this species at Langbank, on the River Clyde, where I found it subsequently. At this spot the ebb tide leaves a long s tch of mudflats, with small brackish pools, where I took quite a num r of specimens among the seaweed attached to stones. They were much larger, however, than those I captured in the firth, some measuring about 15 mm. in length.

† "History of the British sessile-eyed Crustacea, Vol. II., p. 395.

there is just the probability of an error having been made in the identification of the species by one or other of these zoologists.

I. pelagica, Leach.—Some doubt evidently exists as to the distinctness of this species. Thus, Rev. Thomas R. R. Stebbing, in referring to Mier's remarks on this family, observes:—"*Idotea marina* (Lin.) is the name he adopts for that which Bate and Westwood describe as *Idotea tricuspidata*, Desm., and *I. pelagica*, Leach, and which has also been called by a dozen other names."* I have found this species frequently in many localities in the Firth. A close examination leaves little doubt as to the distinctness of the species. The short and stout body; the different form of the terminal segment of the metasome; the greater length of the stylets of the second pair of pleopoda of the male, which extends much beyond the inner plate; the small coxal plates which are not contiguous; the short and robust inferior antennæ make it impossible to confound with *I. baltica*.

Occurrence.—L.w. near Inveraray; off Davaar Island, 5-6 fms.; off Sanda, 10 fms.; off S. and Holy Isle, 6 fms.; l.w. Cumbrae; off King's Cross, Lamlash Bay, 2-3 fms.; Ettrick Bay, 11 fms.

I. emarginata (Fabr.), though closely allied to *I. neglecta*, is readily distinguished by the form of the last segment of the metasome, which is abruptly truncated at the tip, with the lateral corners projecting.

Occurrence.—Lamlash Bay, 7 fms.; off Blindman Rock, Kintyre, 9 fms.; Ettrick Bay, 9 fms.; off Portincross Castle, 10 fms.

(The late Dr. Robertson records having "taken it at l.w. among seaweeds, Cumbrae.")

I. linearis (Pennant).—This is also a readily distinguished species. The terminal segment of the metasome is truncated at the tip as in *I. emarginata*, but whereas in that species the body is oblong *oval* in form, in *I. linearis* it is oblong *linear*. The inferior antennæ are of great length, reaching nearly to the end of the metasome. The metasome occupies one-third of the entire length of the animal.

Length of male, 29 mm.; of female (with ova), 17 mm.

Females bearing ova in July and August.

* "A History of Crustacea," p. 373. (Int. Sci. Series, Vol. LXXIV.)

Occurrence—Ettrick Bay, 9 fms.; off King's Cross, Lamlash Bay, 9-10 fms.; Minard Bay, Loch Fyne, 2-3 fms.; Garrison Bay, Millport, 2-3 fms. (considerable number of young specimens by tow net); off Hailie Shore, Largs, 2-6 fms. (mod. common).

(The late Dr. Robertson records it as "taken in a sandy pool at l.w., Cumbrae.")

Note.—Since the above paper was read before the Society I have taken *I. granulosa*, Rathke, among the seaweed attached to the Buoys in Lamlash Bay, where it occurred plentifully.

The Waders of Solway.

By Robert Service.

[Read 28th November, 1905.]

Of this fine group of birds, some fifty-six species have been recorded as British. Thirty-one of these have been found in our area—rather an unsatisfactory total considering the attractions in Solway for birds of the class. Those on our list may be briefly classified into four divisions—

(1) Eleven breeding species, all of them being present in winter also, with the exception of the Dotterel and the Common Sandpiper. Those eleven species are the Dotterel, Golden Plover, Oyster-catcher, Common Snipe, Curlew, Ringed Plover, Lapwing, Woodcock, Dunlin, Common Sandpiper, and Common Redshank.

(2) Seven winter visitors that come here to stay through the cold season, viz.:—Grey Plover, Turnstone, Jack Snipe, Purple Sandpiper, Knot, Sanderling, and Bar-tailed Godwit.

(3) Five species, seen only on the spring or autumn migration, viz.:—the Grey Phalarope, Little Stint, Curlew Sandpiper, Greenshank, and Whimbrel.

(4) The eight remaining species are all stragglers of more or less rarity—Black-winged Stilt, Great Snipe, Temminck's Stint, Green Sandpiper, Red-necked Phalarope, Ruff, Spotted Redshank, and Black-tailed Godwit.

It is of importance to draw attention once again to a point that has often been noted before—the comparative scarcity of some species, in regard to numbers, present in Solway when contrasted with their comparative abundance along the East Coast of Great Britain. A glance at the map will show that the Solway Firth lies directly west of the narrowest part of Great Britain, a piece of land that almost any migrant might fly across in an hour; yet how few do it when compared with the vast flocks that go down along the East Coast once they have crossed over the North Sea!

Without further preliminaries, let me give you my enumeration of the Waders of Solway—

Dotterel *(Eudromias morinellus).*

The eggs have been taken on the mountains above Loch Dungeon. Some years ago I heard the call of the Dotterel there on a rather wild, stormy day in May, but was unable to see the bird. Dr. Davidson, of Sanquhar, a good ornithologist, now in California, discovered Dotterels on the hills west of Sanquhar about 1882, but failed to find the nests. At one time there were a few pairs on the Moffat range, but whether they are still there in the breeding season I am without any recent information.

On their northward migration in spring, flocks were often seen on the ploughed fields some thirty to forty years ago. These are not observed now-a-days, and for the last ten years at least I have neither heard of nor seen any on the southward journey.

Ringed Plover *(Egialitis hiaticola).*

One of our most familiar species, but spread along shore for most of the year in small parties, aggregating less only than the Sea Pyet, the Dunlin, the Knot, and the Redshank. Everywhere comparatively tame and confiding, it owes its immunity from inclusion in many shore-shooters' bags to this confidence in human nature. In winter some very large flocks are occasionally seen, but these disperse whenever good weather again recurs.

Golden Plover *(Charadrius pluvialis).*

Breeds abundantly on nearly all of the hills and much of the lower ground adjacent thereto. Some seasons they will remain in their breeding places till far on in the autumn, and I have noted flocks on Queensberry in mid-November in mild weather. One of the pleasantest sounds of returning spring is the plaintive whistle of the Golden Plover falling down from the heavens when a migration rush is coming on. Long after our own Golden Plover are engaged in nesting duties, I have recognised the notes of the same species going northwards at night in company with Knots and others so far on as the end of April and till mid-May. Where these birds were going to is one of the puzzles presented to the student of migration.

Grey Plover *(Squatarola helvetica).*

A rather scarce bird on the Solway, but once its favourite spots are known it is not difficult to make its acquaintance. It is irregular in its numbers, some years bringing very few. It has some affinity to the Bar-tailed Godwits in its choice of feeding grounds, and may often be found in their company.

Sir William Jardine records having shot a pair of Grey Plovers so early as August at one of the Lochmaben lochs.

Lapwing *(Vanellus vulgaris).*

Perhaps not so abundant as it used to be a generation or two ago, but still vastly numerous and breeding everywhere. At the autumn migration it never goes past in the same vast numbers as I remember in the sixties, but sufficient still to make it one of the most conspicuous migrants we have.

By the last week in March we find many eggs, and by a little measure of restriction—with which I am proud to know I had something to do—eggs can be taken up till 15th April, and no longer. May I direct your attention to a little point in the life history of the Lapwing which I made known a good many years ago, but, so far as I am aware, the observation has not been confirmed by others? One day at the end of May, 1892, while passing along a road in Southwick, a Lapwing flew over my head holding betwixt its legs, pressed up against its abdomen, with its tail at the same time much depressed, what I have

every confidence in saying was a young one. The bird alighted in the adjoining field, and I marked the spot, and, on running up, found a young one, perhaps four days old, or less. Many years before I had seen a similar incident, and the belief is very general amongst country folks that Lapwings will, when any danger threatens, remove their young to safe spots by carrying them. The carrying of their young must be a rare incident in the life of the Lapwing or it must have been noticed. But how are we to account for the certainly widespread belief of the rustic population that it frequently does so?

Turnstone *(Strepsilas interpres)*.

Not much of our shores is suitable for this species, consequently it is not so common with us as it is elsewhere. It seems to be more abundant on both sides of Luce Bay than it is anywhere else on our coast, while on many long stretches of the Solway Firth it is either absent or very scarce.

Oyster-Catcher *(Hæmatopus ostralegus)*,

or, as I prefer to call it, the Sea-Pie, is far and away the most conspicuous bird of the flats of the Solway Firth. Flocks extending along shore for nearly a mile in length may be seen now and again in autumn, and the enormous numbers to be seen in the course of an October day in the vicinity of Southerness must be seen to be believed. One of our handsomest birds, in its contrasted colours of red, black, and white, it is a favourite with the shore gunner, but a tough one to bring down, and wary as possible. It breeds in small numbers all round our shores, doing so on the shell beds well within highest-water mark, confident in the knowledge that the "bird tides" of May and June will not flood it out of house and home, or up amongst the buttercups and sea pinks of the merse banks, or high up beside the rock roses on the grassy nooks of the cliffs. Many little colonies nest on the islands, such as Rough Island, Hestan, the Ross, and the Murray Isles in Fleet Bay. On the Annan and the Nith and Dee occasional pairs nest far inland on gravel beds and low meadows. In September and October single birds or pairs, or sometimes small parties, are frequently seen on the inland pasture fields far from the sea. I have a strong

impression that we see the Sea-Pyets at inland localities far more frequently than was formerly the case.

BLACK-WINGED STILT *(Himantopus candidus).*

Only two instances of the occurrence of this fine species in Solway Firth have ever been recorded, and that was so long ago as 1684—just 221 years since! They were got by a soldier, who, if we read the old Latin right, "transfixed them with a spear" and gave them to his superior, Wm. Dalmahoy, one of the officers of the King's bodyguard, and who, in his turn, sent one of the birds to Sir Robert Sibbald, who published the incident in his *Scotia Illustrata*. These were the first of the species that seem to have been recorded in the British Isles. The "lake near Dumfries," where these first Black-winged Stilts were got, cannot now be identified, as some lochs that would have answered the description have long been reclaimed and ploughed over.

GREY PHALAROPE *(Phalaropus fulicarius)*

is a species of pretty frequent occurrence in some autumns, though by no means always present at that season. November is its usual time of appearance. I have often thought that they are sure to occur after any unusually wild gales from west or north-west in early November, as the times of their appearance here have always been preceded by such a storm. Possibly they may about that time be passing down outside our western Scottish coasts to their winter quarters, which are understood to be somewhere off the Canaries on the open ocean, though this seems to be only vaguely known.

When seen in Solway, the Grey Phalarope is always extremely tame, as is the case elsewhere in Great Britain. On 10th August of this year a friend of mine, Mr. George Robson, Barncleugh, and a most competent observer, found one on his land, sitting on a small pool, which permitted a thorough examination at close quarters before flying off. This date is a rather remarkable one.

RED-NECKED PHALAROPE *(Phalaropus hyperboreus).*

A bird of extreme rarity with us, only one occurrence being known, nearly forty years ago.

Woodcock *(Scolopax rusticula).*

During my time there has always been plenty of Woodcocks' nests, and I have seen and handled an egg of the species that was taken near Loch Kindar so long ago as 1828. I have no particular reason to think that they breed more abundantly now than they have been in the habit of doing any time these last fifty years. I have had the good fortune to see the young carried by the parent bird. The young was held betwixt the feet and pressed up against the abdomen, and certainly not hanging down the same as if held by a hawk, as we have seen the thing painted by Wolf in a well-known picture. It is a beautiful and interesting study to watch the old birds courting as they flit about the oak trees in the April and May gloaming.

Like other places, we have the usual large influx of October and November Woodcocks from abroad. It may be of interest to note that, of late years, some Woodcocks bred in Northumberland, and marked there, were shot the following winter in Wigtownshire.

Great Snipe *(Gallinago major).*

The Great Snipe occurs only at long and uncertain intervals. One was taken so long ago as 29th September, 1818, at Barnsoul of Irongray. The late Gilbert Anderson, Sen., in the course of a lifetime on Glenlee, shot two—one of them in 1868, and another in 1877. One was shot on Slogarie on 8th October, 1880, by Mr. Bruce. Another was got on the neighbouring estate of Hensol, 27th October, 1882. Then I can give the record of two others, both of which came to me in the flesh—one was taken on 2nd October, 1896, the other on 28th September, 1904, and both occurred at neighbouring localities near Crocketford.

Very curiously all of the birds mentioned are from different parts of Kirkcudbrightshire. So far as I know, there are no actual records from either Dumfriesshire or Wigtownshire.

Common Snipe *(Gallinago cœlestis).*

Although the haunts suitable for the Common Snipe have greatly diminished, enough remain to make it still a most familiar species. Very pleasant it is to hear its "tyik tyuck"

in the nesting season, and to listen to its still mysterious drumming as it rises high over the bogs and mosses. A great and most noticeable augmentation of its numbers occurs each year in mid-October.

Jack Snipe *(Gallinago gallinula).*

An interesting species, varying much in the numbers present from winter to winter. It is always conspicuous in suitable localities soon after its arrival in early October. Successive arrivals come in during the winter, these depending apparently upon the weather elsewhere, as it is a bird that seems peculiarly sensitive to meteorological changes.

Dunlin *(Tringa alpina).*

Extremely abundant on our great stretches of sand and mud and shingle. Moving upwards or downwards with the flow or ebb of the tide, the big flocks of these birds always form an attractive sight to the ornithologist even when his interest may be languid and listless.

By the first week of May many pairs are upon the long salt merses west of Southerness Point, and most charming it is to watch their courtship. The thrilling notes of the male come very near to being a veritable love song. The birds that breed at Southerness are of the small race, whereas those found breeding away inland round the lochs of the hill district are larger and brighter, and are quite a month later in going to nest. The species is most variable in measurements, and the seasonal and age changes in the plumage are very striking and not easily followed. Altogether the Dunlin is an interesting study, whether we see it at its breeding stations on the merse-land pools or around the moorland tarns in the wilder and lonelier lands around the three Cairnsmores, or see it rush along the shore on stormy winter days, now showing their dark upper wings to the observer or turning up their silvery white under-parts as they glide past, or hear it on dark spring nights piping plaintively as parties of them migrate on their northward flight.

Little Stint *(Tringa minuta).*

Three specimens of the Little Stint, shot together from a small party feeding at the mouth of a little stream a mile west of Southerness Point, on 3rd September, 1887, were the first I was able to record of the species in our area, although doubtless the Little Stint, like many another rarity had been coming and going, without observation, through untold time.

In the autumn of 1902 several more were seen by myself at the same place. In September, 1903, a pair was seen on the Blackshaw at the mouth of the Lochar. Then this year there has been quite a notable visitation. The Duchess of Bedford saw a small party on the sands of Cree in September. Within a day or two after her Grace wrote to tell me of the occurrence I heard of them also from Southerness, Cummertrees, and Rockcliffe. Altogether between thirty and forty birds must have been under observation. The Little Stint stays apparently only a few days with us in Solway, but there is little doubt also that its annual visits must be most intermittent.

Temminck's Stint *(Tringa temmincki).*

There is one certain occurrence in a bird I saw at Hastings' (the bird-stuffer) shop about thirty years ago, and Hastings told me he had had another long previously.

Curlew Sandpiper *(Tringa subarquata).*

This seems to be very scarce with us during the autumn migration, and is usually confined to the Dumfriesshire coast. Gray, in his *Birds of Ayrshire and Wigtownshire*, says "it is not commonly met with" in Wigtownshire. Altogether it is a species that, locally, I have very seldom met with, and have to confess that I know very little about it.

Purple Sandpiper *(Tringa striata)*

is to be found the whole winter through in small parties of half-a-dozen or less, wherever sea-weed covered rocks fringe the shore. They delight in remaining just where the surf splashes about, requiring them to jump up out of its reach as each wave dashes in. I have seen it here so late as 11th May.

On 10th November, 1887, one was shot at Kirkmichael, eleven miles inland.

Knot *(Tringa canutus).*

An extremely common species, at least within the limits of the Solway Firth itself. Here great flocks are always on the move, more especially during the later autumn months. It is only exceeded in numbers by the Sea-Pyet and the Dunlin. It remains sometimes in May till the summer or breeding plumage has been attained, departing northward with the last flocks of migrants to the Arctic regions.

Sanderling *(Calidris arenaria).*

Though never very abundant, this species is of general distribution in small parties. Whether it always remained with us in winter may be a matter of doubt, so far at least as any considerable number is concerned. On 4th January, 1900, I shot several Sanderlings at Southerness, and have since ascertained that a good many birds have remained the whole of each winter since. The whiteness of their plumage makes them very easily seen and identified. It is of interest to note in this connection that Macpherson & Duckworth state, in their *Birds of Cumberland*, that the Sanderling does not winter on the opposite side of the firth.

Ruff *(Machetes pugnax).*

An irregular summer visitant, occurring at pretty long intervals. Sir Wm. Jardine, writing in 1844 *(British Birds)*, says "he had often shot them on the banks of the Solway, where from August to October they may almost always be met with." That is assuredly not the case now-a-days. When Gray & Anderson wrote in 1869 they said the Ruff "was rare." There is a specimen, shot at Lochrutton about 1880, which is now in the Kirkcudbright Museum. A Ruff and a Reeve were taken at Carsthorn in October, 1903. One was shot several years ago on the Caerlaverock Estate, which forms the eastern side of the narrowest part of the Nith estuary, and another bird of the species, now on the table, was shot only a month ago, almost on the same spot as the other.

Common Sandpiper *(Totanus hypoleucus).*

One of our most welcome summer visitants, a bird beloved of anglers, helping to enhance the attractions of many a lonely stream side with its lively flittings and long trilling notes. It is found everywhere along the larger water-courses, and wherever the lochs and lochans have gravelly or stoney margins it will be found there also. The eggs, to my eyes, are always very handsome looking, while the nest, though not really difficult to locate, is a test for most people's skill. In early autumn it goes down to the shore, remaining there a week or two before finally departing.

Green Sandpiper *(Totanus ochropus).*

This bird has not been noted of late years, the last I heard of having been on 6th January, 1885, when one was shot at Kirkland, Kirkmichael.

The specimens alluded to by Yarrell as shot in Dumfriesshire were, according to Jardine, killed in spring at the mouth of a small tributary of the Annan, where they remained some days, notice having been sent to Mr Murray of their being there, as a bird not known. They had also been seen near the same spot in previous years. Once or twice the Green Sandpiper has been seen near Jardine Hall in winter, stationary for some weeks, frequenting the banks of the Annan where it was soft or some large ditches. One was shot in January, 1836, which had remained for some time, and was frequently seen in some ditches sheltered all round with wood. When disturbed, it would not continue flitting along the ditch, but would at once rise over the trees and leave for the time, its return being often intimated by its shrill whistle when passing in before alighting. Smellie Watson shot a specimen near Castle Douglas in 1840. There is another record of one shot at Barnhill, Terregles, about 1862.

Redshank *(Totanus calidris).*

Of this abundant resident, Gray and Anderson said—"Is nowhere more abundant than in the Bay of Luce, from Port-William to the Drumore coast. Its summer haunts are numerous throughout the district, and present a variety of scenery from the low-lying marshes of the south of Wigtown to the chain of

moorland lochs lying embosomed among some of the finest mountain ranges in our district." That, as you will note, applied to Wigtownshire at the time, and does so yet. But elsewhere in our area it was only after 1880 that a great extension of the Redshank took place, by which its breeding haunts have spread from the merses and mosses along shore to almost every suitable place within our limits. Long after my boyhood, when nesting rambles occupied, in their season, every hour of spare time, there were no Redshanks to be found breeding away from strictly shore localities. As I have said, they are everywhere now-a-days in spring.

In winter, of course, they are very abundant, serving most efficiently as sentries to every one of the wild birds within hearing of their alarm calls, which are emitted on the slightest appearance of anything suspicious.

Spotted Redshank *(Totanus fuscus).*

This is a very scarce bird, and it is only within the last few years that we have been able to establish it as an undoubted migrant here. Those acquainted with the calls of the sea birds were quite convinced of having heard it, but until Mr. Robert M'Call shot a specimen at the mouth of one of the creeks near Carsethorn in October, 1900, its actual occurrence in Solway had not been put beyond doubt.

Greenshank *(Totanus canescens).*

By the end of August, and thenceforward for some five or six weeks or more, this species is often met with in certain favoured spots. The mouths of the Dee and Urr, as well as the Nith, are frequented, and they come considerable distances up the tidal portions of these waters to feed on gravel banks. There is a suspicion that the Greenshank breeds somewhere in the recesses of the Galloway or Dumfriesshire hills, as young birds have been shot in a very early stage of plumage.

Bar-tailed Godwit *(Limosa lapponica).*

With the first big rush of migration in late August or earliest September come the forerunners of this interesting species. Thereafter their numbers steadily increase until October ends,

and after that period they diminish rapidly, though seldom, if ever, entirely absent till the northward flight takes place in April or later. Comparatively few are to be seen on the banks in the spring migration, for they arrive late and hurry on quickly.

I have seen as many as five hundred in one flock, but thirty to forty is the more ordinary number. Some autumns they are very abundant, the season of 1882 being a memorable one in this respect. In that year they seemed to be actually the prevailing species. Comparatively infrequent on the other estuaries, they abound on that of the Nith.

The soft oozy banks adjoining the green merse lands, and quite away from the firm sand and shingle or gravel, are their favourite haunts. Here their long upturned bills find suitable spots in which to bore and prod. They seem to procure many bivalve shell-fish in such places; at least I have regularly found such pabulum in the stomachs of birds shot on spots of this character.

Black-tailed Godwit *(Limosa belgica)*.

Although it is stated in the fourth edition of *Yarrell*, p. 490, that "it is a tolerably regular visitant to the morasses of the Solway," I have not found it so in my experience. Specimens were shot on the Nith, a couple of miles below Dumfries, in November, 1881 and 1883, respectively, since which no others seem to have turned up, although the species has been seen at this particular part of the river occasionally.

The Curlew *(Numenius arquata)*.

What would our moors and mosses be like in spring and summer without the vociferous whaups? One of the finest charms of their loneliness is the ring of the wild voice of the Curlew as its calls echo and re-echo and reverberate from hill to hill and from knowe to knowe till the very air itself seems to be vibrating in unison! For my part, I always look upon the day, or rather the night, when the whaups first come up in a body to take possession of their inland quarters as the opening of the season. It may happen as early as the 5th of February or as late as the 14th of March, as it was in the years 1893 and

1881 respectively, but when it does happen, then spring has assuredly come too. At one time, a long while ago now, I made an investigation into the source of the food sought for by the Curlews when they first arrive on the moors. It was a matter of wonder to me what they could be getting in sufficient quantity at a period which has apparently little to offer. Beetles were what I found in the stomachs, and in comparatively huge quantities. As a result, I compiled quite a long list of species of Coleoptera. One has only to turn over a stone at the date referred to, when the beetles will be found either newly awakened from hibernation or freshly emerged from pupation. How the Curlews get them is another question, for only the finest sunshine seems to tempt these insects forth. The Curlews of Solway, for the most part, have clutches of four eggs, although a clutch of three is frequent enough, and two is a figure quite common. On some two occasions I have found clutches of five.

With the opening days of July the stay of the Curlews on the moors and mosses is beginning to draw to a close. The old or young bachelors and a few immature or feeble birds have remained along-shore during the breeding season. But even of these a few will go with the others to the breeding places. It is these latter or the barren birds that leave first, and they seem always to make straight off for the shore or its immediate vicinity. Those with broods are in less hurry to go down country. They gather together in small parties of one or two, or sometimes more, families, coming or going for the first week or two of July from their nesting haunts to the grass parks and meadows or along the turnip fields. The principal business at this time of the year on the part of the old birds is the teaching of their young to avoid the arch enemy—man—and every other thing or animal that seems the least bit suspicious. As the young become stronger on the wing and more self-reliant, the daily journey becomes longer and more varied, till by the middle of August considerable flocks have gathered along the seaboard districts. The autumn days progress into darker and longer and more chilly nights, and the Curlews spend a greater length of time in seeking their food on the broad stretches of sand and mud left bare by the ebbing tide.

Now the home-bred birds are joined by those of more northern

and eastern origin, and the watcher will note how the flocks he has been observing will disappear some dark October evening, and how for the next few days only a few odd birds will be seen. Then flocks muster up from he knows not where and again go off, leaving comparatively few to pass the winter months and enliven the wide solitudes of the sand banks with their movements and long-drawn eerie cries.

The shore gunner has a great regard for the Curlew. Not for any particular delicacy it may display as a table fowl, for, as a matter of fact, its shore feeding on crabs, mussels, lug worms, and such like dainties does not conduce to a flavour that recommends it to a cultivated palate. The attractions of the Curlew as a bird of sport lie in its extreme wariness. He who can get his eye on a Whaup before it gets its eye on him, and who can thereafter stalk and shoot it, is a sportsman worthy of commendation, and, I my add, envy also.

Whimbrel *(Numenius phæopus).*

In May it is an interesting occupation to watch the small parties of Whimbrel passing on their migration from some such favourable place of observation as Southerness Point. These are, as a rule, at great heights, but their tittering calls will attract the eyes upwards to the compact little flocks rapidly passing out of sight. From the 10th to the 15th May, during the mid-day hours, the Whimbrels will regularly be seen at this time if the weather be warm and genial, with a gentle breeze or none at all, and light, fleecy white clouds speckling the skies. Only a few of these passing migrants alight, and they never stay more than a day or so, although a succession is kept up during the most of the month. Sir Wm. Jardine once shot a pair on a salt marsh on the Ross at the mouth of the Dee, which he thought were breeding, but no nest could be found. On a moor in Closeburn a nest, supposed to be that of a Whimbrel, was shown to me on June 15th, 1895. Two eggs had been taken from it, one of which I examined. It looked like that of a Whimbrel, and certainly no one could have distinguished it from an authenticated egg, but, of course, full proof was wanting. The Whimbrels stay long with us in autumn, but are then scarce and local.

Such, then, is my list of the Plovers and their kindred that I can give as species belonging to the Solway area. No ornithologist may question their superiority as a group of birds, whether we look to their aggregate numbers, to their importance as food (second only in this respect to the game birds themselves), to the sport they afford, or, above all, to the interest they have for the bird student and the field naturalist. No other group surpasses them in the extent and regularity of their migrations nor in the vastness of the flocks that perform these travels. Though of real songs they have none, yet their voices have a music in their wild and multitudinous notes that enthrals the nature lover, attuned, as they are, to the murmur of the waves and the threnody of the winds.

A Campbeltown Palm-lily (*Cordyline australis*).

By Rev. David Landsborough, LL.D.

[Read 26th December, 1905.]

The outstanding feature in the vegetation of tropical countries is the Palm; in sub-tropical it is the Palm-lily. In some, as in parts of our own, several species of both grow together. This, however, is only of recent years. The late Lady Campbell, South Park, Campbeltown, had the honour of being the first person to plant a Palm-lily (*Cordyline australis*) in the open air in Scotland. She was richly rewarded: the tree grew till it became the amazement of all who beheld it. Looking at it, one was ready to doubt if they were in cold Scotland, while persons who had lived in Japan and similar countries were made to feel as if they were in those countries again. It had been planted in a most favourable spot, and it so grew in height as to be taller than some species of Palm. Its canopy was specially remarkable, and had a spread such as few species of Palm attain, while the great bunches of flower terminating its branches when in bloom made a display such as the flowers of no true Palm

ever exhibits. It would have been a grand example even in its native country, for a gentleman who for years held a high official position in New Zealand said he had never seen there its equal; while Professor Balfour, on seeing its photograph, said he had never seen another so good. How completely it had taken to its new home was shown by the seed which fell from the tree germinating in the borders and footpaths beneath, these being distributed to friends all around. Thus was it for many years; but, alas! the tree is now a thing of the past. I have said that the spot where it was planted seemed most favourable, but few things are perfect. It grew most luxuriantly, but this also tended to its ruin. A great storm came from an unusual quarter and in the direction in which it was most exposed, and its luxuriance gave the wind the greater hold upon it. The result was that it was so injured that it was taken down. Now it is represented by its progeny. I give the measurement of the largest of these—one planted in 1877.

August, 1905.—Height of trunk, 7 feet 8 inches; height of tree, 22 feet; spread of branches, 16 feet 8 inches; girth of stem, 3 feet 5 inches at five feet from the ground; at base, 5 feet 6 inches; flowers this summer, twelve great terminal bunches.

Parent Tree.—The parent tree was planted about 1860, and was thus more than a half older than the one sprung from its seed. It would thus have now been 30 feet in height, and with the very remarkable spread for a plant bearing the name of Palm of fully 25 feet, and bearing about a score of magnificent heads of flowers. The popular New Zealand name, "Umbrella Palm," is given from its umbrella-like spread.

Rope made of the Fibre of the Campbeltown Palm-Lilies.—Lady Campbell, as above stated, experimented in planting a Palm-lily in the open air at Campbeltown. Captain Stewart, late R.N., Stronvaan House, Campbeltown, has continued the experiment by trying whether this tree, of rope-producing fibre in Formosa and Japan, could be utilised for the same purpose in Scotland. He caused leaves to be taken from the trees, steeped

them, separated the fibres, prepared them for being spun, and sent them to the ropework. He also has met with success. A rope, somewhat short in fibre, but very strong, is the result. I send a small piece as an example. Had the *Cordyline* been introduced to this country in the days of our fathers, many a good rope and tether would at the coast have been made from it. Now, however, it would not be profitable, as trade is open with countries where the Palm-lily grows much more rapidly than in Scotland. It is, however, very interesting to know that from so remarkable a tree, growing in our gardens, as the *Cordyline*, a strong and durable cordage can be manufactured. We therefore heartily congratulate Captain Stewart on his success.

Nesting Dates of some of the Waders (*Charadriidæ*).

By John Robertson.

[Read 27th February, 1906.]

The nesting periods of our local breeding birds, the earliest and latest dates, together with the number of eggs comprising the clutches, are matters which might very well have more attention devoted to them, as I think most of our waders begin to lay earlier than the text-books say. In the hope of drawing more attention to the subject, I give some particulars regarding those waders with which I am most familiar.

Ringed Plover (*Ægialitis hiaticula*).—On 10th April, 1898, at Girvan, I saw a nest with one egg. This I considered early, but on 3rd April, 1904, a nest with one egg, also at Girvan, was seen by several members of the Andersonian Naturalists' Society. On 15th July, 1905, in Bute, I saw a nest with three eggs, apparently fresh.

Golden Plover (*Charadrius pluvialis*).—The 10th of April is about the date on which this species begins to nest on Mearns Moors; but there, on 9th April, 1893, I took a nest with four eggs, at an altitude of nearly 700 feet. These eggs were not quite fresh,

and the first egg had probably been deposited on the 3rd of the month. On the other hand, on 17th July, 1898, at an excursion of the Andersonian Naturalists' Society, I saw young in down, only a day or two hatched, nearly 2,000 feet up on Benyellary, Kirkcudbrightshire. This locality is about two miles beyond the limits of "Clyde."

Lapwing (*Vanellus vulgaris*). — Nesting begins, in normal seasons, about 25th March.

Oyster-Catcher (*Hæmatopus ostralegus*).—The first days of May are usually here before the Oyster-Catcher begins laying, and I have seen eggs on the Farne Isles as late as 15th July. In Bute the majority of nests contain three eggs, but two and four are common. Four in a clutch is quite frequent—not an occasional occurrence, as we are often told.

Woodcock (*Scolopax rusticula*).—Though locally numerous in the "Clyde" area, my knowledge of the nesting habits of this species is too limited to be able to say when nesting commences. I have only seen two nests, and each of these contained two eggs, on 2nd April.

Common Snipe (*Gallinago cœlestis*).—On the Mearns Moors the first eggs are laid about 10th April.*

Dunlin (*Tringa alpina*).—Laying begins on the Mearns Moors about 7th May. On 30th April, 1893, I saw a nest in which one egg had been laid, but unfortunately it had been crushed by a cow treading on the nest. This was on Eaglesham Moors, at an elevation of about 750 feet. This species nests on the natural pastures close to the shore in Bute, but I have been unable to ascertain the exact nesting period there, although one would naturally expect it to be considerably earlier than on the moors of East Renfrewshire.

Common Sandpiper (*Totanus hypoleucus*).—This species begins to nest about 11th May. On 6th May, 1893, I discovered a nest, with three eggs, at an elevation of about 1,150 feet, on the Kilpatrick Hills. In Mitchell's *Birds of Lancashire* an early nest, with four eggs, is mentioned as having been taken by Mr. T. Altham on 25th April, 1875, presumably in Lancashire.

* On 28th April, 1907, at an elevation of 650 feet on Eaglesham Moors, I saw four young Snipe about three days hatched—almost a March nest.

Assuming that the eggs were correctly identified, this is a remarkable date.

Redshank (*Totanus calidris*).—On Mearns Moors this species does not begin to nest till about the 15th of April.

Curlew (*Numenius arquata*).—The 16th of April marks the beginning of the Curlew's nesting season. I once saw a clutch of *five* eggs on Mearns Moors, and the eggs were apparently all laid by the same bird.

I have indicated the date on which each species commences to nest, but these dates refer to the earliest nests, and laying may not be general for some days later.

Some notes on the distribution of the Clyde Crangonidae.

By Alexander Patience.

[Read 20th April, 1906.]

Our knowledge regarding the distribution of some of the rarer species belonging to the family *Crangonidae* within the Clyde sea-area has been somewhat limited, the records of their occurrence being confined to one or two localities only.

Some time ago, Dr. Thomas Scott, F.L.S., of H.M. Fishery Board, Aberdeen, published an interesting and valuable contribution on the subject of the *Crangonidae*, bringing together for the first time the various records of the Scottish species.* No additional records had, however, been added for the Clyde species since his list of the Crustacea was published for the British Association meeting in Glasgow in 1901.†

Until the advent in that year, of the scientifically equipped yacht, "Mermaid," belonging to the Millport Marine Biological

* "Some Notes on the Scottish Crangonidae," *Ann. of Scot. Nat. Hist.*, Oct., 1902, pp. 225-231.

† Handbook on the Natural History of Glas., &c., 1901, p. 330.

Association, opportunities for the systematic investigation of special groups in the Firth of Clyde had been few, and dredging was mainly confined to the shallower waters. Prior to that time the principal work carried out in the deeper waters, beyond the fifty-fathom limit, was accomplished (1) by the steam-yacht, "Medusa," under the direction of Sir John Murray, when Dr. J. R. Henderson was enabled to carry out investigations on the distribution of the *Malacostraca*, and was successful, not only in increasing our knowledge of the distribution of many of the rarer forms of the higher Crustacea, but in recording several species which were new, not only to the Clyde sea-area, but to the British Coasts;* and (2) by the s.s. "Garland," belonging to the Scottish Fishery Board, with which a considerable amount of general investigation work was carried out from time to time. The Crustacean records are embodied in Dr. Scott's list of the Clyde Crustacea, already referred to.

Since the "Mermaid" was put into commission I have been able at different times to carry out investigations on the distribution of the *Malacostraca* on systematic lines. These investigations extended from the Gareloch to the southern boundary of the Clyde sea-area, including all the principal lochs and a considerable part of the Barrier Plateau, dredging being carried out in depths down to 107 fathoms. I have been able, therefore, to gather quite a fair collection in this important group of the Crustacea, which has shown a much more extended distribution for some of the rarer forms, and this I now propose briefly to set forth.

It may be interesting to note here that quite a number of the Crustacean species, which I have been able to record from time to time as having been observed apparently for the first time in these waters, have been taken in depths within the twenty fathom limit, so that even the shallower waters of the Clyde sea area have not yet been exhausted of their biological treasures, and doubtless many prizes yet await the labours of the enthusiastic investigator.

In referring to the species in these notes, I have in the meantime adopted the following classification of the genera

* *Trans. Nat. Hist. Soc. Glas.*, Vol. I. (N. S.), p. 317.

proposed by Mr. Stanley W. Kemp, B.A., of the Irish Fishery Board, Dublin.*

Notes on the Species.

GENUS PHILOCHERAS,† Stebbing, 1902.

Philocheras trispinosus (Hailstone).—I first came across this species in July, 1904, while dredging in Kames Bay, Millport, in about four fathoms, and in this locality I have subsequently found it. Two females with ova measured from the extremity of the rostrum to the end of the telson about 20 and 30 mm. respectively. They could be quite readily distinguished from among the adult specimens of *Crangon vulgaris* (Lin.) by the coloration alone. The carapace was of a pale yellow colour with a sprinkling of light reddish dots, the abdominal segments being greyish brown dotted with light brown spots, while the sides of the pleura were marked with dark brown. I also found several specimens in Lamlash Bay, in the vicinity of King's Cross, in about eight fathoms. Most of the specimens from both localities did not exceed 10 mm. in length, and came up in the tow-net usually in company with *C. vulgaris*. At this stage of growth they bear a close resemblance to, and may be readily passed over for, the latter species of approximately the same size, but, by a slight comparison, I found that *P. trispinosus* may

* *Ann. & Mag. Nat. Hist.*, Ser. 7, Vol. XVII., p. 298.

1	Second pair of trunk-legs simple	1. Sabinea.
	Second pair of trunk-legs chelate, 2.	
2	Second pair of trunk-legs about equal in length to first	2. Crangon.
	Second pair of trunk-legs shorter than first, 3.	
3	Second pair of trunk-legs scarcely one-third the length of first	3. Pontophilus
	Second pair of trunk-legs about three-quarters the length of first, 4.	
4	Inferior apices of gills turned forwards, small exopod at base of first pair of trunk-legs	4. Ægeon.
	Inferior apices of gills turned backwards, no exopod at base of first pair of trunk-legs	5. Philocheras.

† Nom. nov. vice *Cheraphilus*. "Marine Investigations in South Africa," Vol. I., p. 47.

be neatly distinguished from among the commoner species by the presence of a narrow brownish-black band across the tail fan, and by the larger and less densely packed spots with which the carapace and pleon are dotted. In each haul there would be approximately one specimen of *P. trispinosus* to ten specimens of *C. vulgaris.**

Dr. Scott records this species from the Firth of Forth, Aberdeen Bay, and the Moray Firth, and it has been recorded by Dr. Norman, F.R.S., from Shetland. Apparently it has not hitherto been recorded from any place on the West of Scotland.

Philocheras bispinosus (Westwood).—This is comparatively a small species, the largest specimens we captured (some females with ova), not exceeding 18 mm. in length. The carapace is furnished with two small spines on the median line, one being situated behind the base of the small and narrow rostrum, and the other, which is generally not so prominent, a short distance behind the first. The carapace is also furnished with many small tubercles, some of which are arranged so as to give the appearance of small irregular ridges, more or less parallel to the median line.

The majority of my specimens were of a pale greenish colour, dotted with small light-brown spots, while the sides of the pleura and carapace were marked with brown. Some specimens, however, taken from off Aoidh Rock, Upper Loch Fyne, exhibited a uniform reddish tint.†

* Note.—While carrying on investigations during the summer of 1907, I found this species to be moderately common off Hailie Shore, near Largs, in about 2 to 6 fathoms, and on a sandy bottom. I also dredged a few specimens off the north end of Great Cumbrae, on the same kind of ground.

† Note.—During this summer, 1906, I captured one or two specimens of *Philocheras* in Garrison Bay, Millport (2-3 fms.), which agreed in all respects with this species, save for the exceptional coloration. The carapace was uniformly coloured a very dark brown, while the fourth segment of the pleon and the tail-fan were each provided with a transverse, although much lighter, dark-brown band. Mr. S. W. Kemp, of the Irish Fisheries Board, to whom I showed it, had no hesitation in referring it to *P. bispinosus*, although he had never met with that type of coloration before in this species. It might be interesting to add that quite a number of small specimens of *Hippolyte varians*, Leach, from the same locality, and measuring 10-12 mm. in length, exhibited exactly the type of coloration that I found in *P. bispinosus*.

Hitherto the records for its occurrence in the Clyde are "off Cumbrae (R.), Ballantrae Bank (F.S.G.)." *P. bispinosus*, however, is moderately common and widely distributed throughout the Firth. We have taken it from several places in the Gareloch, Loch Long, Loch Goil, Loch Striven, Upper and Lower Loch Fyne, in depths from five to forty fathoms; also from several places on the Barrier Plateau. I have also found the remains of this little shrimp in the stomachs of *Gadus minutus* (Lin.) from the Largs Channel, and *Merlucius merluccius* (Lin.) from the Barrier Plateau, about 1 mile N.W. of Ailsa Craig.

Females had ova during July, August, and September.

Philocheras echinulatus (M. Sars).—This species, like *P. sculptus* (Bell), and *Pontophilus spinosus* (Leach), has a spiniferous carapace. There are five prominent ridges which extend almost the entire length of the carapace. The central one is armed with three teeth, the principal ridge on either side, which is somewhat irregularly formed, has six, while each of the other two lateral ridges has two teeth towards the proximal end. On each side of the central ridge, arising from the posterior end of the carapace, is a very short ridge terminating in a small tooth.

Dr. Henderson records, "a single specimen off Skate Island, Loch Fyne, 105 fathoms, mud," and it is one of the species recorded by the "Garland," as occurring "near the mouth of the Clyde estuary, where it was found moderately frequent." This species is distributed along the whole of the deep water of the Arran Basin in depths from fifty to one hundred and seven fathoms. We took about one hundred specimens from various stations in the Kilbrannan Sound,* the Channel to the east of Arran, and Lower Loch Fyne. Approximately, there would be about one specimen taken for every six specimens of *Pontophilus spinosus* (Leach). It was also one of the species taken by the trawl from a number of places on the Barrier Plateau. Females had ova in July and September. The largest specimens taken measured about 40 mm. in length.

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* We took from four stations in this deep trough from off Carradale to the Cock of Arran, quite a number of specimens of *Nika edulis*, Risso, and *Pasiphæa sivado* (Risso) in 84, 76, 80, and 69 fathoms respectively.

Philocheras neglectus (G. O. Sars).—In this species the rostrum is moderately broad, and well rounded at the apex. The carapace is of a uniform brown colour, while the fourth abdominal segment and tail-fan have each a transverse band of the same colour. This conspicuous coloration might serve as a ready means for the identification of the species, but as *P. fasciatus* (Risso) imitates closely this type of coloration one requires to be careful. The last-named species, however, may be readily separated from *P. neglectus* by the broadly truncate apex of the rostrum.*

Dr. Scott was the first to record this species from Loch Tarbert (Loch Fyne) in 1886, and it is evidently not at all common in our waters. My only captures have been two specimens from Ettrick Bay, ten fathoms, and one specimen from Lamlash Bay, eight fathoms.

Philocheras sculptus (Bell).—The rostrum in this species is comparatively broad and abruptly truncate at the apex. (In one of my specimens the apex is slightly concave.) There are five more or less irregularly formed ridges armed with teeth. The central ridge has two prominent teeth, the principal ridge on either side has three or four very small teeth, and each of the two lateral ridges have two strong teeth near to the proximal end. The dorsal surface of the abdominal segments are sculptured, the third, fourth, and fifth segments are keeled, and the sixth segment

* Note.—Since this paper was read before the Society I have been successful in obtaining a specimen of *Philocheras fasciatus* (Risso) from Garrison Bay, Millport, in about two fathoms. It is a female with ova, and measures about 20 mm. from extremity of rostrum to end of telson. The carapace exhibited a greenish tint and was dotted with small brown spots, the sides of the pleura being marked with deep purple. The abdominal segments are of a much lighter green than the carapace. The fourth segment exhibited both anteriorly and posteriorly pale grey bands, which threw the middle portion (which had exactly the same tint of green as the rest of the abdominal segments) into relief. This gave to the Crustacean the appearance of having a transverse band on this segment of a much darker hue. There was no indication of any band across the telson and uropods. The departure from the normal coloration in this species and *P. bispinosus* is interesting, but I am now inclined to the belief that, among many of our Crustacean species, colour is of little specific value.

and proximal half of the telson are channeled. Length, about 16 mm.

This is evidently a rare species in the Scottish seas, and there are only two records hitherto for the Clyde, two specimens from Lamlash Bay (Norman), and one specimen off Muggie Point in 20 fathoms (Henderson). I have taken two specimens altogether of this species, one from off the Bullwood, Dunoon, in eight fathoms (1892), and one from off Inchmarnock in fourteen fathoms, hard ground (1901).

GENUS PONTOPHILUS, Leach.

Pontophilus spinosus, Leach.—The rostrum in this species has a strong spine on each side near to the base. The carapace is armed with five longitudinal ridges, which are much more regular in form, however, and the teeth thereon more prominent than in *Philocheras echinulatus*. The central ridge and the principal ridge on each side are armed with three strong spines. On the other lateral ridges there are two teeth near to the proximal end.

This species is distributed from the mouth of the Gareloch to the boundary of the Clyde sea-area, and I have noticed its occurrence in the principal lochs and in many places over the Barrier Plateau. It is moderately common throughout the deep water of the Arran basin, having been trawled in depths up to 107 fathoms. I have also frequently dredged it in comparatively shallow water.

Females had ova during April, July, and August. Largest specimens measured about 55 mm. in length from apex of rostrum to the end of telson.

GENUS CRANGON, Fabricius.

Crangon vulgaris (Lin.).—This is the commonest species in the Firth of Clyde, belonging to the family *Crangonidae*, and is found in abundance along all our sandy shores. I have also found it in the River Clyde about one mile to the east of Langbank in the mud-pools which are left by the ebb tide, where the water is quite brackish. It was in company with *Gobius minutus*, Gmel., *Pleuronectes flesus*, Lin., *Sphaeroma rugicauda*, Leach. *Idothea viridis* (Slabber), and *Gammarus locusta* (Lin).

Crangon Allmanni, Kinahan.—This species closely resembles *C. vulgaris*, but may be readily distinguished from that species by the presence of two parallel keels with a deep groove between, situated on the sixth segment of the pleon. It is, however, only found in the deeper waters of our Firth, its distribution being somewhat similar to that of *Pontophilus spinosus*, but it is usually taken in the trawl in greater numbers than that species.*

Note on the Occurrence of Saxifraga oppositifolia, L., the Purple Mountain Saxifrage, on the Sea-coast of Islay.

By Alex. Somerville, B.Sc., F.L.S.

[Read 24th April, 1906.]

At the May meeting of the Society two years ago, our member, Dr. Gilmour, Port-Ellen, was able to exhibit fresh specimens of the Three-fingered Saxifrage, *Saxifraga tridactylites*, L., from the Machrie Sand-dunes, Islay. The plant was new to his own vice-county, the South Inner Hebrides, and, but for the record of a single specimen from Tiree by Mr. S. M. Macvicar, would also have been an addition to the known flora of the West of Scotland.

On the present occasion, Dr. Gilmour has been able to send for exhibition fresh flowering specimens of another Saxifrage, new to his island and vice-county, viz., *Saxifraga oppositifolia*, L., a plant very different from the previous, and indeed from all the other seventeen British species of the genus; prostrate and creeping in habit, and possessing a relatively large flower of brilliant purple.

* Note.—Up till the present time I have been able, with the use of the "Mermaid," to make observations on the distribution of the Malacostraca at about 720 stations in the Firth of Clyde. I hope, shortly, to place the complete record, not only of these observations, but also of those I had made for some years prior to the advent of the "Mermaid," in the hands of the Recorder in the Natural History Department of Glasgow University, where they will be available for the use of marine zoologists.

We are accustomed to look on *S. oppositifolia* as a true "alpine," inhabiting the higher levels—the *Students' Flora*, indeed, giving its altitudinal range as extending to 4,000 feet. What renders Dr. Gilmour's discovery remarkable is that he met with the plant, a fortnight ago, growing luxuriantly at what we may call the zero of altitude, viz., on exposed coast rocks of the Mull of Oa, at almost within reach of the waves! Are we now, therefore, to add this plant to the short list of those which are happy either at high, or at the lowest, levels, such as the Sea-pink (*Armeria*), the Sea-campion (*Silene*), or the Sea-plantain (*Plantago*)?

How different is the habitat of the plant under notice from the shifting sandy soil of the Islay golf course, where *Saxifraga tridactylites* was shown, two years ago, to abound, in the month of May, at a very few miles distance!

Dr. Gilmour has added various species to the known flora of his island and vice-county, notably *Hymenophyllum tunbridgense*, Sm., and the plant under notice. His name would doubtless appear more frequently but for the memorable and exhaustive botanical expedition to Kintyre and Islay conducted in 1844 by the late Professor J. H. Balfour, and a party which included the well-known Professor Babington and Dr. Parnell, author of the *Flora of the Grasses of Britain*, and during which expedition 440 species were put on record as occurring in Islay. Then, besides, our ex-President, Mr. Ewing, a few years ago did good search work, adding various species to the Islay list.

Out of the 41 Watsonian vice-counties of Scotland, *S. oppositifolia* is stated in *Trail's Topographical Botany of Scotland* (1898) to occur in 24, only two of these lying south of the Forth and Clyde Canal. Perhaps its nearest natural habitat to Glasgow is the summit of Ben Lomond, 27 miles distant, where its purple cushions strike the eye here and there about the time of Victoria Day (24th May).

Regarding the West of Scotland distribution of *S. oppositifolia*, the plant is recorded from the Harris hills of the Outer Hebrides and from the hills of Skye, and Mr. Macvicar has taken it on the hills of West Inverness; but there is another somewhat surprising, yet authentically recorded, station, viz., the Mull of Kintyre, where, in 1844, Professor Balfour met with it near the

Lighthouse, presumably on the neighbouring high cliffs. This is but twenty-eight miles in a direct line over-sea from Dr. Gilmour's Islay station on the Mull of Oa. We would like much to know whether the plant still inhabits Kintyre peninsula.

Lastly, there is a record which certainly now requires confirmation, as it has been long unconfirmed. I refer to that of "Clyde Isles"—*i.e.*, Buteshire. We know of no one who has ever seen the plant there, in Arran or in Bute. The record is set down by H. C. Watson in the *Cybele Britannica*, but without personal authority.

It should be mentioned that *S. oppositifolia* finds a congenial home in several North of England, Welsh, and West of Ireland high-level stations.

In regard to the foreign distribution of our plant, Ostenfeld's *Flora of the Faroes* (1901) states it to grow in that island group, and in Babington's *Flora of Iceland* (1870) it is stated to occur in various localities, where it sometimes bears white as well as purple flowers.

As to its geographical range elsewhere abroad, Bentham (1866) has to state that it is to be found "in moist alpine situations in the higher mountain ranges of Europe, and in Russia and Central Asia, extending far into the Arctic regions," and we note that Sir Joseph Hooker includes America also.

So the plant before us girdles the world in the upper part of its Northern Hemisphere, while at the same time it has the humility—shall we term it—to bloom beautifully on our garden rockeries, as was seen at the excursion of the Society to Doonholm, Ayrshire, on the 16th of the present month.

P.S. — Professor Trail kindly informs me that *Saxifraga oppositifolia* is to be met with on the sea-coast in Aberdour and eastern Gamrie, in Northern Aberdeenshire and Banffshire.

On the Occurrence of Gobius orca, Collett, within the Clyde Sea Area.

By Alexander Patience.

[Read 29th May, 1906.]

While carrying on investigations on the steam yacht "Mermaid," during the summer of 1901, I found among the organisms brought up by the trawl a small fish belonging to the family *Gobiidae*, which resembled in some respects *Gobius Jeffreysii*, Günther. It differed obviously, however, from that species in the coloration. Professor MacIntosh, F.R.S., of St. Andrew's University, was good enough to examine it for me, and identified the species as *Gobius orca*, Collett.

The following are the chief specific characters:—Body much compressed, the greatest depth being slightly more than half of the length of the head. Head depressed, and is contained a little more than four times in the total length. Lower jaw projects beyond the upper. Eyes situated superiorly, very large and almost contiguous. Head and throat scaleless. Scales of the body comparatively large. First and second spines of the anterior dorsal produced into filaments. Basal membrane uniting the ventral fins absent. The coloration of the body is of a greyish brown, without distinct spots or bands, but on the sides, below the beginning of the first dorsal fin, at the end of the anal, and base of the caudal, there is a darker shading, tinged with brilliant blue, which gives to the living animal a rather beautiful appearance. The first dorsal is of a uniform brownish-black. The second dorsal has alternate brownish-black and faint white bands.

1. D. 7 ; 2. D. 10-11 ; A. 9 ; V. 5-6 ; P. 17 ; C.^{3} 13^{3}.

This species, which is among the smallest and rarest of European fishes, was first described by Robert Collett, of Christiania, in 1874,* from a specimen captured by Professor

* *Annals and Mag. Nat. History*, Vol. 13, Ser. 4, pp. 446-7.

Sars, Jun., at Espevar, in the mouth of Hardangerfjord (59° 35′), from a depth of 80 to 100 fathoms, in 1873. Altogether, six specimens have been taken off the Norwegian coast. During the cruise of the steam yacht "l'Hirondelle," belonging to the Prince of Monaco (1885-8), two small specimens, measuring about 24 mm., were taken at the depth of 166 m. in the Gulf of Gascoigne, off Sables d'Olonne (Lat. 46° 27′ N., Long. 6° 30′ O.).*

The only reference to its occurrence in the British Seas is found in Collett's work referred to, where he observes — "En dehors de la Norvége, sa présence n'a été constatée jusqu' à présent que sur la côte nord de l'Ecosse (Kilbrannan Sound), où on en a recueilli un individu en mars 1888; cet exemplaire a été décrit et figuré par Günther sous le nom de *G. Jeffreysi*, mâle." †

Occurrence.—I have taken altogether three specimens within the Firth of Clyde during the past five years—

(1) Largs Channel, between Keppel Pier and Fairlie Sands‡ (Lat. 55° 45′ N., Long. 4° 54′ W.), 19 fathoms, hard ground, by shrimp trawl. A female (mature), 36 mm.; to root of caudal, about 29 mm.

(2) Between Scalpsie Bay and Cock of Arran (Lat. 55° 44′ N., Long. 5° 11′ W.), 75-89 fathoms, mud, by shrimp trawl, male, length, 34 mm.; to root of caudal, 26 mm.

(3) In mid-channel (Lat. 55° 41′ N., Long. 5° W.), 51 fathoms, mud, by shrimp trawl, male; length, 34 mm.; to root of caudal, 27 mm.

Gobius orca has now been assigned to the genus *Lebetus*, instituted by Winther, in 1877, to receive this and a closely allied species, *G. scorpioides*, Collett, in which the structure of the ventrals is somewhat different from that which obtains in most of the other species of *Gobius* (which consists in not having the base united by a membrane). Collett, however, observes in this connection — "Mais, comme cette membrane

* Résultats des Campagnes Sc. de "l'Hirondelle," Fascicule X. poissons par Collett, p. 41.

† *Op. cit.*, p. 43 (for Collett's reference (115), *vide Proc. Roy. Soc. Edinr.*, March, 1888, p. 210, pl. III., fig. B).

‡ We also took at this station a fine specimen of *Raniceps raninus* (Lin.). The only other record for its occurrence in the Clyde is by Dr. Scouler, in 1860 (*Proc. Nat. Hist. Soc. Glasgow*, Vol. I., p. 8, 1868).

transversale peut parfois être basse ou peu distincte, même chez les Gobies typiques, il est douteux que l'on doive conserver le genre *Lebetus*." *

In two Clyde specimens of *Gobius minutus*, Gmel., taken in Minard Bay, Loch Fyne, in 1901, the membrane at the base of the ventrals was only very slightly indicated.

The closely allied species, *Gobius Jeffreysii*, Günther, can be readily recognised by the presence of five dark prominent spots along the middle of the body, and by a dark, indistinct line descending from the eye.

Günther has recorded this species from three localities in the Clyde. It is, however, not uncommon, and is widely distributed throughout the Firth, in depths from 10 to 80 fathoms. I have observed it very frequently in the trawl during the past five years.

Little Stint (*Tringa minuta*) at Balgray Reservoir.

By John Robertson.

[Read 29th May, 1906.]

On 2nd September, 1905, I saw two, and on the following day four, Little Stints at Balgray Reservoir, East Renfrew. They were evidently birds of the year. They looked like small Dunlins, but the margins of the feathers on the upper parts were much lighter, not so tawny as in the Dunlin, and this gave the birds a lighter appearance. Their bodies were not so stout, being thinner and proportionately longer than the Dunlin's. Their bills were smaller, black, and almost, if not quite, straight. The legs were blackish. When standing with their backs towards one, there was a light, straight line on each side of the bird, beginning at the shoulder, and appearing to meet at the back. The under parts were nearly white, as was the throat, but the breast had a rufous tinge. There was a decided eye stripe. When

* *Op. cit.*, p. 42.

away from the company of Dunlins, the Little Stints seemed easier of approach. When flying they had a somewhat uncertain, wavering flight. The note was quite different from the Dunlin's, being weak and high-pitched, though rather pretty. It was somewhat like the syllables "peet, peet, peeter, peet." The note is said to resemble that of the Sanderling, but subsequently I had favourable opportunities at Troon of hearing the Sanderling's note, which, to my ear, was quite different. It was an explosive "wick, wick," stronger, but not capable of being heard so far off as that of the Little Stint. Each "wick" was separate, no suspicion of an "r" running through the syllables and uniting them. To me the note of the Little Stint was much prettier than that of the Sanderling.

The part of the reservoir the Little Stints frequented most was a narrow margin of mud laid bare by the receding water, so soft that even with their light weight they sank in it, and only walked about with considerable difficulty.

The Common Sandpiper *(Totanus hypoleucus)*.

By John Robertson.

[Read 29th May, 1906.]

The Common Sandpiper, in general appearance, is of a brownish-grey on the upper parts and the breast, while the under parts are white. When in flight an indistinct whitish bar is seen across the wings as well as white tips on the outer tail feathers.

It is a summer migrant, arriving from the first week of April onwards. A lively and engaging bird it soon makes its presence known by its cheery notes which have been rendered "Tibby thiefy, tibby thiefy" or "Kylie-leekie, kylie-leekie." It moves about a great deal after dark, and is often first heard for the season, calling as it passes overhead at night, but this wandering at night is not confined to the time of arrival, but may be noted at any time during the season the bird is with us.

During the first few days after arrival, especially if the weather is mild, the birds fly hither and thither over the water evidently in great excitement Sometimes they are just skimming over the water, at other times they are high up, beating the air with short strokes of the wing, giving the impression that the wing joints are stiff and the birds are trying to make them supple by practice. All the time they are giving vent to a pleasant trilling note, their nearest approach to a song.

This species frequents all kinds of streams and sheets of water, sluggish rivers and mountain torrents, lakes and ponds, but it has a preference for those with gravelly and sandy banks or margins. Although said not to frequent the sea coast, in my experience it is quite common there.

I have seen nests by the shore in Bute, on Sgat Mohr, and Liath Eilean in Lochfine, small islets without a drop of fresh water. On Inchmarnock, among a number of eggs destroyed by Carrion Crows were those of the Common Sandpiper. When I paid a visit to the island of Eigg a few years ago, one of the first birds I saw when I landed was a Common Sandpiper which I flushed from a nest and four eggs not fifty feet from salt water. I found the bird common all round the Island of Muck, which cannot boast of a respectable burn. In fact, any time I have been at the coast, in the season, I have found the bird more or less numerous. It is not particular whether the water is salt or fresh, clean or dirty. It even nests on the banks of the sluggish and polluted White Cart in Nether Pollok and Hawkhead Estates. I remember when it used to frequent an old clay pit between Pollokshaws Road and Victoria Road, Glasgow, and probably nested there.

By the first week of May the early birds begin to select nesting sites. The earliest nest I have seen was on 6th May, 1893, one with three eggs, on the Kilpatrick Hills. The site chosen is usually on some sloping bank, it may be at the water's edge, or it may be 300 yards back from the water. The nest is a slight affair, not, as a rule, very well concealed. A hollow scratched in the ground, with a few pieces of grass, dead leaves, or withered herbage, receives the four pear-shaped eggs. These are placed with the pointed ends inwards and downwards, so that they are nearly standing on end, and consequently occupy an

extremely small space for their size. They are of various shades of light brown, blotched, and spotted with darker brown and lilac, and they are very handsome.

When the nest is approached the bird usually flies off silently towards the water, and if the direction of flight is carefully noted the nest can be located with tolerable ease. If one comes on the nest suddenly, however, the bird tumbles off, and runs along with wings outspread and fan-shaped tail trailing along the ground, at the same time uttering a squealing note. Should the disturber remain in the vicinity of the nest or young the two old birds fly around making a great deal of noise. They will then alight on trees, shrubs, or fences, and give vent to their feelings against the intruder by uttering notes of alarm as frequently and as loudly as they are able. The young in down are delightful little creatures, and run soon after they are hatched.

Before they are able to fly they squat to escape observation as a rule, but if close to water they will take to it readily and dive, coming up some yards away, and remaining motionless by the water's edge or hiding under herbage.

By the end of July the Common Sandpiper begins to collect in small flocks of ten to twenty birds. The greatest number I have ever seen in a flock was twenty-four at Balgray Reservoir.

This habit of collecting in small flocks is one that is not mentioned in books on birds, but in this locality it is quite characteristic of the bird. They are then very restless, flying to and fro over the water, calling all the time. From the beginning of August this species grows less in numbers, till by October they have all departed. I have never seen it later than the end of September.

On some Terrestrial Isopods new to the Clyde Faunal Area, and some Notes on the Distribution of the Rarer Species.

By Alexander Patience.

[Read 26th June, 1906.]

The Terrestrial Isopods do not seem to have received much attention from Scottish naturalists. Of the twenty-five species recorded for the British Isles, only ten have been hitherto recorded for Scotland, nine of which have been noted as occurring within the Clyde faunal area.

The principal contributions to this subject have been made by the late Dr. Robertson, Millport,* and Dr. Thomas Scott, F.L.S., of H.M. Fishery Board, Aberdeen.† But a glance at the following list of Clyde species by Dr. Scott, published in 1901, will at once show that our knowledge of the distribution of most of the rarer species was somewhat limited:—

Fam. Oniscidae [Ligiidae.]

Ligia oceanica (*Lin.*).—Under stones, &c.; more or less c. in various places. . . . . .

Fam. Trichoniscidae.

Trichoniscus pusillus, *Brandt.*—Cumbrae (R. I, 86): Rothesay, nr. Aquarium (S.). Prob. not unc. if carefully sought for.

T. roseus, *Koch.*—E. Tarbert (S.).

Fam. Oniscidae.

Oniscus asellus (*Lin.*).—Gen. dist. and mod. c.

Philoscia muscorum (*Scopoli*).—Widely dist. and not very unc. (R. I, 85).

Porcellio scaber, *Latr.*—C. and gen. dist.

P. pictus, *Brandt.*—Cumbrae (R.): Ayrshire (Smith): nr. Campbeltown, 1896 (S.).

Cylisticus convexus (*De Geer*), ...—Kilwinning (Smith, vide R. I, 88): Lanarkshire: Rothesay (S.).

Armadillidium vulgare (*Latr.*).—Mouth of Garnock (Smith, see R. I, 88).

* Catalogue of the Amphipoda and Isopoda of the Firth of Clyde. *Trans. Nat. Hist. Soc. Glasgow*, vol. 2, pp. 9-99, 1888.

† Brit. Assoc. Handbook of the Natural History of Glasgow, 1901. Isopoda, pp. 335-336.

Feeling, therefore, that something more might be done to increase our knowledge upon this subject, I have devoted some considerable time during the past few months in further studying the distribution of these forms within this area, and propose to set forth here, briefly, the results I have obtained, with the hope that some other naturalists might be led to pursue the subject further; for I have but little doubt that careful investigation in the right places will reveal many of these interesting forms.

While engaged in this work many opportunities, which I gladly accepted, were kindly offered to me for investigating hothouses, orchards, cultivated and other private grounds, to which entrance could be obtained only by express permission. I am now able, therefore, not only to note the occurrence of three additional species, but also to record a much more extended distribution for most of the rarer species already known to exist within this area.

Terrestrial Isopods, or, as they are commonly called, "Wood-lice," are of retiring habits, and are generally to be found beneath stones, decaying timber, vegetable matter, in manure heaps, and in moss-grown places—in fact, generally in situations where they obtain a certain amount of moisture, which seems to be necessary for their existence, their breathing organs being to some extent branchial in character.

But I have found a number of species of the genera Oniscus, Porcellio, Cylisticus, and Metoponorthus living in considerable numbers in the hothouses which I have been allowed to examine, especially in tomato-houses, where the food is both choice and abundant, where there is usually a sufficient amount of moisture—at least for these species—due to the regular watering of the plants, and where the warmer temperature is evidently appreciated by these organisms. The species belonging to the family Trichoniscidae, however, do not seem to find the conditions of hothouse life at all agreeable, and consequently seem to shun these situations. In all probability the amount of moisture is quite insufficient for these smaller wood-lice, and in almost all the cases where I have found them inhabiting greenhouses, the temperature was not much higher than that which obtained outside. It might be necessary to state here that all the species I have met

with living in hothouses I have also found in quite open situations.

These wood-lice do considerable damage to the plants, however, evidently enjoying the food offered by the roots of the young plants, among which I have found them often in clusters. They receive, in consequence, but scanty consideration from the fruit-grower. But they are not always strict vegetarians, and will not hesitate, should the necessity and opportunity arise, to sacrifice some near relation. While keeping a number of individuals of *Cylisticus convexus* (De Geer) in captivity, I found that they had no scruples in making a meal, occasionally, of some of the weaker members of the family, and once, having occasion to put together in a tube an individual of this species and one of *Trichoniscus roseus* (Koch), I found, on returning to examine the creatures some time afterwards, that all that remained of the latter was a little bit of his outer coat.

One fact which struck me while observing these wood-lice in the hothouses and elsewhere was the apparent associating of certain species with others. In some places I found *Porcellio dilatatus* Brandt, mixing freely with *Cylisticus convexus*, both species being present in considerable numbers. In a small greenhouse in Camphill Gardens, Glasgow, I met with some individuals of *Trichoniscus pygmaeus*, G. O. Sars, and *T. pusillus*, Brandt, in company with hundreds of *T. roseus*, and no other wood-lice near. In one hothouse *Metoponorthus pruinosus*, Brandt, seemed to hold the place to the almost total exclusion of all others. *P. dilatatus* being found very sparingly inside, though they were in fair numbers in the grounds in the neighbourhood; while in another hothouse *C. convexus* was the only species in evidence, and there they were present in considerable numbers. In open situations I have found the three species, *Oniscus asellus*, Lin., *Porcellio scaber*, Latr., and *Cylisticus convexus*, generally in company.

New Records.

Genus Trichoniscus, Brandt, 1833.

Trichoniscus pygmaeus, G. O. Sars.—This is one of the smallest of the land-isopods, the adult female measuring about $2\frac{1}{2}$ mm. It may be distinguished from all other species of the genus by the three-articulate flagellum of the antennæ, by the lateral parts

of the segments of the mesosome being armed with small spines, and, in the male, by the conspicuous copulative organs. These latter I have dissected out, and they agree with the details given by Sars—"Inner ramus of first pair of pleopoda greatly produced, with the terminal joint narrow knife-shaped; that of the second pair bi-articulate, proximal joint very short, distal joint long and slender, styliform." I have met this species in company with *T. roseus* in two localities (3, 4). While moving about it cannot very readily be distinguished from the young forms of that species of approximately the same size (about 2 mm.), as the difference in colour is not discernible, although, by watching closely, the movements of one of the species (*T. roseus*) are seen to be appreciably quicker. Under the microscope, however, the following differences are revealed:— In *T. roseus* the colour, as a rule, in these young specimens is uniformly light orange, while in *T. pygmaeus* it is whitish, with a few light-red pigmentary ramifications across the segments of the mesosome. The eyes in *T. roseus* appear to consist of a single visual element, while in *T. pygmaeus* there are three visual elements, which are arranged in a triangular form. The tubercles of the dorsal face are more prominent in *T. roseus*, and the flagellum of the antennæ is usually quite distinctly four-articulate, even at this early stage of growth. Length of adult male, 2 mm.; of female, about 2½ mm.

Occurrence. — (1) Field near Carntyne Road, Glasgow; (2) field, Cumbernauld Road, Glasgow; (3) conservatory, People's Palace, Glasgow; (4) Camphill Gardens, Glasgow; (5) field, Poplar Park, Lanark; (6) road near Wemyss Bay Station.

This species is apparently new to Great Britain. It has been recorded by Sars for the vicinity of Christiania, Norway.

Genus Porcellio, Latr., 1804.

Porcellio dilatatus, Brandt, is closely allied to the common form, *P. scaber*, Latr., but may be readily distinguished from that species by its unusually broad body and by the shape of the last segment of the metasome, which is rounded at the tip and is not dorsally grooved. It is not so strongly tuberculated as is *P. scaber*. The colour is dark slaty-grey, but somewhat

lighter than the last-named species, and it is slower in its movements. I observed the young escaping from the brood-pouch of the female during the months of June, July, August, and September. Length of adult male, 12 mm.; female, 13 mm.

Occurrence. — (1) Poplar Park, Lanark; hothouses, in considerable numbers; sparingly in grounds in neighbourhood; (2) Clachranehill, Ayr; hothouses and grounds, though not in abundance; (3) Toadhills, Kilwinning; hothouses and grounds, not very common; (4) Millbrae, Chryston; hothouses, considerable numbers; grounds, few; (5) Queen's Park Gardens and Camphill Gardens, Glasgow, few.

Genus Metoponorthus, B. Lund, 1879.

Metoponorthus pruinosus, Brandt, may be distinguished from the species of the genus *Porcellio* by the almost straight frontal margin, the slight development of the lateral lobes of the cephalon, and the narrow metasome. The antennæ are long and slender, and are banded with white. The colour of the dorsal face is dark reddish brown, but when the animal is alive and moving about it exhibits a uniform violet grey, which gives to the animal a rather striking and beautiful appearance. This is due to a substance which easily comes off when the animal is handled. It is one of the most agile of the wood-lice. Length of adult male, 9 mm.; of female, 10 mm.

Occurrence.—(1) Poplar Park, Lanark; hothouses and grounds, not uncommon; (2) Clachranehill, Ayr; hothouses, considerable numbers; grounds, sparingly; (3) Toadhills, Kilwinning; grounds, few; (4) Millbrae, Chryston; hothouses and grounds, few; (5) Botanic Gardens and Queen's Park Conservatory, Glasgow, few.

Notes on the other species.

Trichoniscus pusillus, Brandt. — Common and widely distributed; very sparingly in hothouses examined. In open situations sometimes in considerable numbers.

Principal Localities.—(1) Several places in Great Cumbrae; (2) near Rothesay; (3) near Langbank; (4) near Wemyss Bay

Station; (5) several places, Stonebyres Estate, Lanark; (6) near Kilwinning; (7) near Ayr; (8) Millbrae, Chryston; (9) near Inveraray; (10) near Girvan; (11) many places round Glasgow.

Trichoniscus roseus (Koch). — Widely distributed, and sometimes found in considerable numbers. This species is very attractive in consequence of its beautiful colour, which I have found to range from light orange to blood red. Some specimens from locality (1) are almost quite white. They were in company with *T. pusillus* under a decayed log of wood. The situation was in quite open ground, and I cannot, therefore, account for the abnormal coloration. Females with ova during the months of July, August, and September, and many young individuals during these months.

Principal Localities.—(1) Near Kames Bay, Cumbrae; (2) Stonebyres Estate, Lanark; (3) near Ayr; (4) near Lochgilphead; (5) Garelochhead; (6) near Campbeltown; (7) some fields, Whiteinch, Glasgow; (8) Botanic Gardens, Glasgow; (9) Camphill Grounds, Glasgow; (10) conservatory, People's Palace, Glasgow.

Porcellio pictus, Brandt.—This beautifully marked species is evidently rare. I have never found more than one or two individuals together. It seems to affect drier situations than any other species of wood-lice, all my specimens being got about dry-stone dykes.

Localities.—(1) Clydesbrae, Lanark; (2) King's Cross, Arran; (3) Toadhills, Kilwinning; (4) Carntyne Road, Glasgow; (5) Langbank; (6) Rothesay, Bute; (7) Garelochhead.

Cylisticus convexus (De Geer). — Common and widely distributed, and in some places in considerable numbers.

Principal Localities.—(1) Many places, Stonebyres Estate, Lanark; (2) Toadhills, Kilwinning; (3) Clachranehill, Ayr; (4) Millport, Cumbrae; (5) Wemyss Bay; (6) West Kilbride; (7) Garelochhead; (8) Minard, Loch Fyne; (9) near Greenock; (10) Millbrae, Chryston; (11) conservatories, Botanic Gardens, Alexandra Park, and Queen's Park; (12) many open situations around Glasgow.

C. convexus, var.—This colour variety is almost pure white, relieved by a narrow, irregular, dark-brown band on the median line, running from cephalon to tip of last segment of metasome, with a few small patches of the same colour on both sides of mesosome.

Occurrence.—(1) Two specimens in a hothouse in Poplar Park, Lanark, where, I am informed, they have been frequently seen; one specimen from hothouse, Clachranehill, Ayr.

Philoscia muscorum (Scopoli).—Widely distributed, but never found in great numbers. This species bears some resemblance to *Metoponorthus pruinosus*, but may be readily distinguished by the tri-articulate antennal flagellum.

Armadillidium vulgare (Latr.).—I have never met with this species. The only record of its occurrence in this area is on the authority of the late Dr. Robertson, Millport, from specimens taken at the mouth of the Garnock, and sent to him by Mr. John Smith, Kilwinning.

Note.—Since this paper was read before the Society, I have found the following additional species in various localities in the Clyde faunal area: *Trichoniscus stebbingi*, n.s. (described in the Linnean Society's Journal—Zoology, Vol. XXX., pp. 42-44, pl. 7, May, 1907); *Trichoniscus spinosus*, n.s. (described in "The Annals of Scottish Natural History," pp. 85-88, pl. III., April 1907); *Trichoniscoides albidus*, B. Lund; *Trichoniscoides*, species (?) *Haplophthalmus danicus*, B. Lund; *H. mengii* (Zaddach); *Armadillidium nasatum*, B. Lund; and *A. vulgare* (Latr.).

The six latter species, however, will form the subject of another paper.

Reports on Excursions.

Hunterston and Fairlie, 2nd September, 1905.—Mr. D. A. Boyd, conductor. This excursion was arranged jointly with the West Kilbride Natural History and Archæological Society, but owing to unpromising weather the attendance only numbered thirteen. Leaving West Kilbride, the party proceeded direct to Hunterston by way of Highthorn, the Ayrshire home of Lieut.-General Sir Archibald Hunter, K.C.B., D.S.O. Through permission kindly granted by Mrs. Hunter-Weston, access was obtained to the gardens and policies at Hunterston, where some

time was pleasantly spent. Numerous fungi, mostly common species of *Russula*, *Lactarius*, &c., were observed in the woods. From Hunterston to Fairlie the route lay along the seashore, where various maritime and other interesting plants were noted, including *Ranunculus sceleratus*, *Eryngium maritimum*, *Suæda maritima*, *Salicornia herbacea*, *Scirpus maritimus*, *Zostera marina*, *Z. nana*, *Tortula ruraliformis*, *T. lævipila*, *Zygodon viridissimus*, &c. Owing to rainfall, however, an extended search for plants could not conveniently be made on the shore.

Garscube, 16th September, 1905. — Mr. John Renwick, conductor. There were about fifteen members and friends present at this excursion, eight of them provided with cameras. The policies of Garscube are situated to the north-west of Glasgow, partly within the city boundary and partly in the County of Dumbarton, the River Kelvin here forming the boundary between the two. The river has worn a deep ravine through the sandstones and shales, and the views are very picturesque.

Entering by the lodge nearest to Maryhill the party descended to the side of the river, crossing it by a slight suspension bridge, and proceeded up the valley to the house. The policies are well wooded, and contain many fair specimens of Oaks, Beeches, &c., none of them of any great girth. Near the house, on the side of the river, is a fine Beech; girth, 13 ft. at 5 ft.; bole, 16 ft.; height, 80 ft.; spread, 80 ft. There is a black Poplar near the mill, girth, 11 ft. 2½ ins. at 5 ft.; bole, 50 ft. An American Oak was blown down about 10 years ago, but was raised and seems to be flourishing. It has a girth of 3 ft. 5 ins. at 5 ft., with a height of 48 ft.

The gardens and greenhouses were visited, an old sundial in the garden being photographed. The weather was very fine, and the party appeared to be pleased with their visit.

The ravine of the Kelvin here has evidently been worn out by the river since the ice age. The former course seems to have gone by Millichen, Ferguston, Bearsden, Garscadden, Drumry, and Kilbowie. Near Millichen a bore was put down to 355 feet before touching solid rock, or 221 feet below sea level. "In a pit near Cleddans, Duntocher, the surface sand was cut into at a

depth of 312 ft., and rushed in with such rapidity that the miners with the greatest difficulty escaped with their lives." On Drumry farm a bore was put down 298 ft. through sand, gravel, &c., =230 ft. below sea level. This deep channel has been filled up during the glacial period, and no trace of it is to be detected on the surface. When the land began to be free of ice, and the present drainage to be formed, the waters of the upper Kelvin found a lower road by Killermont and Garscube than by their previous direction, and so made a new course to the Clyde. They gradually wore out the ravine that forms such a picturesque part of Garscube, Kelvindale, Kelvinside, &c., and such a contrast to the upper course of the river above Killermont.

Johnstone Castle, 14th October, 1905.—This excursion was arranged jointly with the Andersonian Naturalists' and West Kilbride Natural History Societies, but owing to unfavourable weather only about fifteen were present.

On account of the coldness of the weather, comparatively few species of the larger fungi were observed in the woods. A list of those seen has been compiled by Mr. R. B. Johnstone, who acted as conductor of the excursion; while the smaller fungi which could be identified have been noted by Mr. D. A. Boyd, and the mosses and hepatics by Mr. John R. Lee.

Doonholm, Auchendrane, and Doonside, 16th April, 1906.—Mr. John Renwick, conductor, who reports what follows. The excursion upon the Spring Holiday, Monday, 16th April, was to three estates on the Banks of the Doon near Ayr, viz.:—Doonholm (James Kennedy, Esq.); Auchindrane (Miss Cathcart); and Doonside (W. H. Dunlop, Esq.).

In each case permission was kindly granted by the proprietor, and the gardener or forester on the estate was waiting for us.

Doonholm, which was first visited, is situated on the right bank of the Doon, not far from Alloway The first point of interest is what the gardener calls a "court-hill," the Ordnance Survey map a "moat," but Dr. D. Christison in his "*Early Fortifications in Scotland*," states that the word is properly "mote." He says, "In treating of the motes, it is necessary at the outset to explain what is meant by a mote. All idea of the modern signification

of the word—the wet or dry ditch of a fortress—must be dismissed, and we must revert to the original meaning, for the motes of which I have to speak are not hollows but heights, not the trenches of fortresses, but the fortresses themselves, and consist essentially of conical flat-topped mounds, which were defended by palisades."

The river here has worn a deep channel 50 ft. or so below the surrounding country, and winds along, with its alluvial haughs now on one side and now on the other. Just below the mote it sweeps round from flowing a little east of north to almost due south, then changes to northwest, continuing in this direction to below the Brigs o' Doon. The valley is thus well sheltered, and the big mass of the brown Carrick Hill and Newark Hill protects it from the prevailing south-westerly winds.

Doonholm is intimately associated with Robert Burns. In his autobiography he says, "For the first six or seven years of my life, my father was gardener to a worthy gentleman of small estate in the neighbourhood of Ayr." In "The Life and Works of Robert Burns, edited by Robert Chambers, revised by William Wallace," there is a note appended stating that this gentleman was Mr. William Fergusson, of Doonholm, a retired London physician, who was at that time provost of Ayr. "On this estate, which he had acquired from the town in 1755, and which is now (1896) the property of Lord Blackburn, long one of the most eminent judges in the Court of Appeal, is an avenue of Elms, the planting of which is attributed by tradition to William Burness."

I mentioned this tradition to the gardener, who pointed out a row of limes running at right angles to the river, as those said to have been so planted. One of the largest of these measures 12 ft. 7½ ins. in circumference, at 5 ft. up, with a bole of 10 ft. It seems not unlikely that these trees may have been planted under the supervision of the poet's father. But as Dr. Wallace calls the trees "Elms," I wrote the gardener a few days after our visit giving him a copy of the foregoing quotations, and asking him if there are any Elms on the estate to which the tradition might refer, or if the use of the word "Elms" is a mistake for Limes. He replied, "I have interviewed Mr. James Ramsay, 78 years of age, who has been resident on Doonholm Estate for 56 years. *Re* the William Burns trees, Mr. Ramsay

says the word "Elms" must be a mistake for "Limes." He says "the line of Lime trees along the riverside, as well as those I pointed out to you, are said to have all been planted by Provost Fergusson, and during the time William Burns was gardener and overseer at Doonholm. There are several Elm trees near the stables, though not in line, which appear to be much about the same age as the Limes near the river." A Mr. Alex. Hunter, W.S., Edinburgh, and commissioner to Lord Ailsa, became proprietor of Doonholm after Provost Fergusson, the date I have not been able to ascertain. Judge Blackburn bought the estate about 1849 or 1850, and Mr. Kennedy purchased it in 1898.

At the foot of the steep bank below the house is a fine Oak, measuring 14 ft. 9 ins. in circumference at 4 ft. 3 ins.; bole, 8 ft., with a good spread, and of fair height. In the haugh are several fine Wellingtonias, but the largest was so much encumbered with brambles, &c., round it that we did not try to measure it. On the river bank is a *Cedrus deodara*, planted about 45 years ago. It measures 7 ft. $8\frac{3}{4}$ in., at 5 ft. up, and the bole does not become much narrower for about 25 ft., but at 8 ft. up it has a curious twist, said to have been caused by the Judge having snicked off the leader by a swing of his rod when fishing. To the east of the house is a Birch, measuring 7 ft. 9 ins. at 5 ft.; bole, 10 ft.

On the sloping bank below the house is a rockery in which are many rock and alpine plants, and a number of Japanese trees are to be seen. From this rockery was obtained the living specimen of *Saxifraga oppositifolia* which was exhibited at last meeting.

At the foot of one of the Lime trees on the banks of the river were several plants of the Toothwort, *Lathrea Squamaria*, L. In the British Association Hand-book this is reported as from Ayr (? probably the county), apparently on the authority of Hooker, and from Dundonald, Smith. Mr. John Smith, in his "Botany of Ayrshire," 1896, records from Dundonald and Maybole, on the authority of a "Botany of Ayrshire," 1882, drawn up by Messrs. Borland, Duncan, and Landsborough. Mr. Smith informs me that he has never found it himself. Dr. Landsborough, in a letter to me, 24th April, 1906, writes—"According to my notes it was found by Smith, of Monkwood, at Blairston, Maybole; Dundonald

Woods, by the Messrs. Paxton, Kilmarnock; by W. M'Cutcheon (on hazel). Clavens Hill, Dundonald; and at Cleuch Glen, Sorn, by myself." This discovery at Doonholm, Ayr Parish, appears, therefore, to be a new parish record for the county.

Proceeding up the bank of the Doon we come to Auchendrane Estate, which here marches with Doonholm, but is mainly situated on the other side of the river. Miss Cathcart, of Auchendrane, who is a member of the Society, having observed in the billet calling the March meeting that we were to make an excursion to Ayr, wrote saying that if we were in Carrick we should be welcome to visit her grounds, although she regretted she would be unable, from failing health, to entertain us. We accordingly passed through the grounds, and saw the very fine Birch which grows on the lawn in front of the house; the Union Trees, a row of six Silver Firs, planted in 1707 in commemoration of the Union between England and Scotland; other Silver Firs, one planted in 1757; two Scots Firs, the one planted in 1707, the date of the other not exactly known, but the tree is notable as the "Wishing Tree." In March last year I gave some notes on the Trees in this estate. In speaking of the Birch, I stated that the only Birch we knew which could be said to exceed it was one at Newton Don, in Berwickshire. But having heard from Dr. A. Henry that this tree no longer existed, I wrote to Mr. C. B. Balfour, of Newton Don, who kindly replied on 20th November, 1905—"The big Birch at Newton Don and its companion have, I am sorry to say, both gone. The smaller Birch went first—I am afraid I do not know when—but probably about 1896. The big Birch lost a limb in a gale, probably the one of Christmas, 1900, which did a lot of damage. I was abroad at the time, and on my return I decided to take the remains of the tree down. It was rotten, and very unsafe. I think, therefore, we took it down in the winter of 1901-2. . . The tree was planted in the time when the Don family owned the place, and very probably was planted in the end of the eighteenth or early in the nineteenth century, when a good deal of planting and laying-out was done."

The tree was thus about a hundred years old.

With the disappearance of the Newton Don Birch, it is

probable that the Auchendrane tree takes first place among Scottish Birches.

Dr. Henry writes—"There are some big Birches at Blair-Drummond, and one with an enormous trunk at Dropmore, England, but not very tall. The Auchendrane one is apparently the finest tree. Blair-Drummond—(*a*) Girth. 13 ft. 10 ins., height, 60 ft.; (*b*) girth, 10 ft. 8 ins., height, 70 ft. Dropmore—21 ft. 4 ins. girth at one foot up, butt short; three great limbs, 9 ft. 10 ins., 8 ft. 2 ins., 6 ft. 3 ins.; height, 62 ft. Laverstoke Park, Hampshire—girth, 8 ft. 11 ins., height, 75 ft."

In her letter last month Miss Cathcart writes—"You will be interested to learn that our weeping Birch on the lawn was brought with other rare plants in the year 1818 from Booth's Gardens in Hamburgh, and is described as 'The Cutleaf Weeping Birch.' My father, who had been studying in Germany, brought a great many rare plants at that time, and of which, as you know, a good many still survive. We made the knowledge about the Birch from old letters we were looking over. I have had some new mould put round the roots this year, and hope it may freshen up the tree, but the storms have done much damage among our trees last winter, and my forester says he never had so many broken branches to prune off."

Having last year made many measurements of the trees here, we took only two on this occasion—(1) A Silver Fir on stable path, girth, 12 ft. $2\frac{3}{4}$ ins. at 5 ft., an increase of $5\frac{3}{4}$ ins. in ten years = ·57 ins. per annum, rather small; (2) a Douglas Fir, 5 ft. $10\frac{3}{4}$ ins. girth; increase in ten years, $4\frac{1}{4}$ ins = ·42 ins. per annum.

On several of "the Union" Silver Firs there were, as I described them in sending a specimen to Dr. Henry, "portions of the ends of the branches showing abnormalities, growths whereon the leaves are beginning to appear, paler green than the rest of the foliage. Apparently the branch has been injured either by an insect, a fungus, or some other irritant or cause of disease. I send one of the bunches, and shall be very glad to learn what is the cause of the curious growth. Has it any relation to the 'witches brooms?'" He replied—"The specimen of disease of Silver Fir turned out to be *Æcidium elatinum*, or 'witches broom,' which is common on Silver Firs on the Continent,

and in some parts of Scotland and in Ireland. See a most excellent account of it in Hartig's 'Diseases of Trees,' English translation by W. Somerville (Macmillan, 1894), p. 179, with figures, &c."

Doonside Estate, on the left bank of the river, below Auchendrane and opposite Doonholm, was seen under somewhat unfavourable auspices owing to the afternoon being wet. There are here the remains of an old building standing on an eminence high above the river and a tributary burn, the angle between the two being cut by a moat. We did not learn anything of its history, except that it was probably a castle or residence of one of the Kennedy families. Near it is a fine Sycamore with a bole of 25 ft. and a girth at 5 ft. of 11 ft. 5 ins., an increase in six years of 2 ins. = ·33 of an inch per annum, small To the W. of the house is a fine Oak, but with a short bole of $5\frac{1}{2}$ ft. where it divides into three large stems. At 3 ft. up it has a girth of 15 ft. 4 ins., an increase of $6\frac{1}{4}$ ins. in six years —average increase 1·04 in. annually. In October, 1889, when I measured it with Mr. George Paxton, it had a spread of 93 ft. It was the largest Oak in Ayrshire Mr. Paxton knew of at that time, but Mr. M'Kay, Mr. William Armour, and I found a larger one at Bargany in 1900, 15 ft. 2 ins. at 3 ft.; bole, 7 ft.; spread, $101\frac{3}{4}$ ft.

On the river side is another Oak also with a short bole, $9\frac{1}{2}$ ft.; girth, 13 ft. $1\frac{1}{2}$ ins at $5\frac{1}{2}$ ft.; increase $6\frac{1}{2}$ ins. in 6 years—average, 1·08 in. per annum. In 1899 it had a spread of 92 ft.

A Tulip tree has the largest girth of any we have yet measured, being 8 ft. $4\frac{1}{2}$ ins. at 2 ft. 6 ins., an increase of $2\frac{1}{2}$ ins. in six years = ·58 inch per annum. But it has a short bole of $5\frac{1}{4}$ ft. where it divides into four. In 1899 it had a spread of $46\frac{3}{4}$ ft., but it has since been much destroyed by storms, and is now decaying. On the river bank at upper end of orchard is a tall Silver Fir, girth, 11 ft. 5 ins. at 5 ft.

In the haugh the gardener pointed out a patch of the Wind Flower (*Anemone nemorosa*) darker in colour both of leaves and flowers than usual, and stated that he had noticed it for several years, but thought it was now a little lighter in colour than formerly.

After a visit to the hothouses, we went down by the little

burn already mentioned to the river, and along to the Auld Brig o' Doon, the Carrick end of which is on the estate of Doonside.

It is curious how one personality pervades this region. But for Burns and his writings this old bridge would have been in ruins, and the neighbouring kirk a shapeless cairn. The trees at Doonholm have a double interest from the probability that they were planted by his father, and the name of Auchendrane is rendered familiar to many all over the world through a portrait by Nasmyth having been in possession of the owners.

The electric cars would not, it is almost certain, have been running out here but for the multitudes drawn hither by his fame, or for the imaginary ride by honest Tam o' Shanter.

The very car stations are named after the "lad was born in Kyle." We came out from "Burns' Statue" to "Burns' Cottage," and now return from "Burns' Monument" to "Burns' Statue."

I wonder what his contemporaries would have said could they foreseen it; including an ancestress of mine who once rebuked her daughters and young Burns from the neighbouring farm of Mount Oliphant for "wasting the gude vittal," when they had been amusing themselves one wet day by pelting each other with oatmeal.

Harelaw Dam, 21st April, 1905.—Mr. John Robertson, conductor.—There were about twenty-two present at this excursion, including a party of eight from the Paisley Naturalists' Society. The Black-headed Gull (*Larus ridibundus*), of which species a great colony nests here, had just started nesting, about thirty nests having eggs, most of the nests containing, however, but one egg, there being only about half-a-dozen with the full complement of three eggs. While some of the party were on the island where the nests are, a Shoveller (*Spatula clypeata*) passed overhead. This duck is rare in Renfrewshire, and is worth recording in consequence. The weather was unfortunately far too boisterous and cold to be enjoyable.

Blackshaw, 28th April, 1906.—Report by Mr. D. A. Boyd.—The party, who numbered five, travelled by rail to West Kilbride,

where they were met by twenty-three others, consisting of members of the West Kilbride Natural History and Archæological Society and several of their friends. The weather was fine, but the coldness of the wind was hardly suggestive of approaching summer. The Dalry Road was followed for about two miles, from West Kilbride to Blackshaw. The strident note of the corncrake (*Crex pratensis*) was heard, and a white wagtail (*Motacilla alba*) was seen. Numerous early-blooming wild-flowers —such as Marsh-Marigold, Wood-Violet, Wood-Sorrel, Red Campion, Purple Orchis, Hare's-tail, Cotton-grass, &c.—were observed displaying their blossoms. Among the cryptogams noted were *Puccinia albescens*, Grev., in its cluster-cup or æcidiospore condition, parasitic on *Adoxa moschatellina*; *Evernia furfuracea* Fr.; and *Bæomyces rufus* DC., bearing its pretty little pink apothecia. A passing visit was made to the site of the cup-and-ring markings near Blackshaw, but it was found that most of the inscribed rock-surface had been covered with soil from an adjacent ploughed field. From this point to West Kilbride the party returned by way of the "Old Dalry Road," from which, in the course of the steep descent along the eastern slope of Law Hill, a splendid view was obtained of the waters and islands of the Firth.

Gareloch, 12th May, 1906.—Report by Mr. D. A. Boyd. Mr. N. G. Reid, conductor. This excursion, which took place in favourable weather, was attended by three members only, viz.:—Messrs. D. A. Boyd, R. Garry, B.Sc., and N. G. Reid. The party travelled by rail to Craigendoran, crossed by steamer to Clynder, and followed the road along the loch side from that point to Garelochhead. In the neighbourhood of Barreman, specimens were observed of *Oniscus asellus*, L., and *Philoscia muscorum*, Scop., two species of land Isopods. The following Microfungi were also noted:—*Peronospora ficariæ*, Tul.—on *Ranunculus Ficaria*; *Protomyces macrosporus*, Ung.—on *Ægopodium Podagraria*; *P. bellidis*, Krieger.—on *Bellis perennis*; *Uromyces ficariæ*, Schum.—on *Ranunculus Ficaria*; *Puccinia violæ*, Schum.—as *Æcidium*, on *Viola sylvatica*; *P. pimpinellæ*, Strauss.—as *Æcidium*, on *Myrrhis odorata*; *P. caricis*, Schum.—as *Æcidium urticæ*, on *Urtica dioica*; *Melampsora*

cerastii, Pers.—as *Uredo*, on *Cerastium triviale; Mollisia atrata*, Pers.—on dead stems of *Œnanthe crocata; Leptosphæria acuta*, Moug.—on dead stems of *Urtica dioica; Cylindrocolla urticæ*, Bon. (stylospore stage of *Calloria fusarioides*, Berk.)—on dead stems of *Urtica dioica*. In the neighbourhood of Rahane, numerous bushes of Bog Myrtle (*Myrica Gale*), as yet leafless, were conspicuous by reason of the abundance of male catkins attached to their branches. Here, too, were found various species of cryptogams, including:—*Uromyces alchemillæ*, Pers.—as *Uredo*, on *Alchemilla vulgaris; Puccinia primulæ*, DC.—as *Æcidium*, on *Primula acaulis; Triphragmium ulmariæ*, Schum.—Primary uredospores, on *Spiræa Ulmaria; Æcidium grossulariæ*, Gmel.—on *Ribes Grossularia; Podosphæra oxyacanthæ*, DC.—Mycelium on *Cratægus Oxyacantha; Trochila craterium*, Fr.—on dead leaves of *Hedera Helix; Stegia ilicis*, Fr.—on dead leaves of *Ilex Aquifolium; Bœomyces rufus*, DC.—on an earthy wall-top. Near Mambeg were found:—*Puccinia rubigo-vera*, DC.—as *Uredo*, on *Holcus mollis; P. bunii*, DC.—on *Conopodium denudatum; Asterina veronicæ*, Lib.—on *Veronica officinalis*. The most interesting discovery was *Protomyces bellidis*, a species which was added to the British Flora several years ago, from specimens gathered at Seamill, West Kilbride. The Gareloch specimens have been carefully examined microscopically, and found to contain the large spores characteristic of the genus. The well-sheltered gardens along the loch side contained many beautiful flowers, conifers, and shrubs, including various species of *Berberis*, *Azalea*, *Rhododendron*, &c., in fine bloom. The woods around Garelochhead appeared to offer conditions very favourable to the development of fungi, and it was suggested that a visit to the district in late autumn might be worthy of consideration.

Mountstuart, Bute, 24th May, 1906.—Conductor, Mr. John Robertson. The morning of 24th May was dismal, wet, and windy, and in every way calculated to discourage outings, so that it was surprising that fourteen put in an appearance at this excursion. By the time Rothesay was reached, the rain had ceased and the sky was clearing, so that the drive to Mountstuart was pleasant, notwithstanding the bitter wind.

At this entrance to the policies, the party were taken in hand

by Mr. Heron, head gardener. The different gardens were then visited, and a few of the notable trees pointed out and measured.

A collection of mosses had been made by Lord Bute's instructions, for presentation to Rothesay Museum, and this collection was submitted to our party to be named, but, unfortunately, none of the members interested in mosses was present. Specimens were taken, however, and submitted to two of our members for identification. Mr. Gordon, the head gamekeeper, had made a collection of birds' nests and eggs, also for presentation to the Museum, and a few of our members spent some time with Mr. Gordon examining his collection.

In going through the grounds the Chiffchaff (*Phylloscopus rufus*), Wood Warbler (P. *sibilatrix*) and spotted Flycatcher (*Musciapa grisola*) were noted.

Rain falling shortly after two o'clock, it was decided to make for Rothesay. On arrival there, after having tea, the Museum was visited, and the objects of interest pointed out by Mr. White, of the local society.

Glengarnock Castle and Ladyland, 2nd June, 1906.—Joint with the West Kilbride Natural History and Archæological Society.—The route from Kilbirnie lay through a pleasantly diversified tract of undulating country. In the course of the ascent towards Glengarnock Castle, some beautiful views of the surrounding district were obtained. The ruins of the castle are situated about two miles north of Kilbirnie, and occupy a strikingly picturesque position on the verge of a precipice overlooking the river Garnock, about eighty feet above the bed of the stream. The only access to the buildings has been from the east. The ground plan of the structure can still be traced, and shows it to have consisted of a quadrilateral tower, with an attached court of wider but less elevated buildings, sixty feet in length, running from the tower to the entrance. The tower is forty-five feet long, thirty-three feet wide, and has been forty feet in height. It consisted of two vaulted apartments, occupying each the whole extent within the walls. The upper apartment or hall was twenty feet in height from floor to ceiling, and from it a narrow circular stair, constructed in the angular thickness of the walls, led to the upper part of the tower, which

was surrounded by a parapet wall. As there are neither arrow-slits nor gun-ports in the walls, the situation of the fortress was probably believed to render it quite impregnable. Several large portions of the building have fallen at successive periods, the most notable being in January 1839, when, during a severe storm, the north wall of the tower, estimated to contain between four and five thousand feet of solid masonry, was overthrown. A considerable portion of the walls has also been carried away at different times, as material for the erection or reparation of neighbouring farm-steadings. About the year 1842, however, the walls were substantially repaired by the late Mr. William Cochran-Patrick of Ladyland.

The superior size and venerable antiquity of the castle have inspired various theories as to its origin and early history. According to some, it may probably have been the residence of the De Morvilles, Lords of Cuninghame; while others suppose it to have perhaps been the home of the renowned Hardyknute. It emerges from mediæval obscurity in 1263, when it came into the possession of Reginald Cuninghame, of the Kilmaurs family, through his marriage with Janet Riddel, heiress of Glengarnock. Their descendants, the Cuninghames of Glengarnock, are referred to in many of the public records down till the beginning of the seventeenth century. In 1613 Sir James Cuninghame assigned his estate to his creditors, by whom it was afterwards sold to Richard Cuninghame, eldest son of William Cuninghame, Keeper of the Signet. The new laird took a prominent part in local affairs, was twice censured by the Presbytery of Irvine for his adherence to the Royalist cause, and was present on the King's side at the Battle of Worcester. After various other transmissions, the castle became the property of the late Mr. Cochran-Patrick, of Ladyland, with whose descendents it still remains.

From Glengarnock Castle the party proceeded to Ladyland, where they were kindly received by the proprietrix, Mrs. K. N. Cochran-Patrick, the Misses Cochran-Patrick (sisters of the late Mr. R. W. Cochran-Patrick, LL.D., F.S.A., &c., formerly M.P. for North Ayrshire, and Under-Secretary for Scotland), and Mr. N. K. Cochran-Patrick, advocate. After tea on the lawn a visit was made to the gardens and policies. The woods contained

a fine display of wild flowers, amongst which the Blue Wood Hyacinth and Red Campion were notably conspicuous.

For several centuries this property was possessed by the Barclays, of Ladyland, a branch of the Barclays, of Kilbowie, descended from the Ardrossan family. Hew Barclay, of Ladyland, was a friend and companion of Alexander Montgomerie, author of "The Cherry and the Slae," and himself a poet of no mean order, as appears from two sonnets written in his happier days. He afterwards embraced the Roman Catholic faith, took part in a conspiracy for a Spanish invasion of Scotland, and was drowned at Ailsa Craig when about to be apprehended by Mr. Andrew Knox, minister, of Paisley, and several other gentlemen who had gone thither for that purpose. About the year 1631 Ladyland passed from the Barclays, and after several transmissions was acquired by Captain William Hamilton. This laird was noted for his attachment to the Presbyterian cause during the period of Episcopal ascendency in the reign of Charles II. Having refused the test he was in 1684 deprived of his military rank, but was subsequently restored to favour, and died in battle fighting against the French before the year 1690. After other transmissions the estate was purchased about the year 1718 by William Cochran, of Edge, ancestor of the present proprietrix.

Sorn, 23rd June, 1906.—Mr. John Renwick, conductor.—The party travelled by rail to Catrine, and walked to Sorn. Up till the latter part of the eighteenth century, Catrine was nothing more than a very small hamlet, although notable in former times as the place where the court of the Bailiary of Kyle-Stewart was held for the administration of justice. It afterwards rose into considerable importance through the erection of extensive mills for the spinning of cotton, which were commenced in 1786 by Claud Alexander, of Ballochmyle, and David Dale, merchant in Glasgow. In the neighbourhood of the town, a path through wood and coppice is carried along the summit of the precipitous banks of the Ayr, from whence are obtainable some fine views of beautiful river scenery. As access to the woods and policies at Sorn Castle had been kindly granted to the party, some time was pleasantly spent in exploring their sheltered recesses. Numerous

species of flowering plants, mosses, fungi, &c., were observed, and measurements made of the dimensions of some of the larger trees. The village of Sorn is prettily situated on the banks of the River Ayr. The parochial church is a somewhat quaint-looking building, with an outside stair leading to the gallery. It was erected in 1658, when the parish was detached from that of Mauchline, and is still in a good state of preservation. After a short walk through the village, the party returned to Catrine, where tea was had before departure for Glasgow. Trees measured were—a Beech, lower down river than Castle, 11 ft. 3 ins. in girth at 5 ft. on high side, bole 16 feet; an English Elm, near bridge, 9 ft. 7 ins. in girth at 5 ft., bole 8 feet; a Robinia, near Cleuch Cottage, 4 ft. 6 ins. in girth at 5 ft.

Milngavie and Strathblane, 30th June, 1906. Mr. Archd. Park, conductor.—Ten members of this Society, three of the West Kilbride Natural History Society, and one of the Paisley Naturalists' Society were present. The route followed was by the golf course, through which there is a right-of-way, thence by Craigallian back road to Strathblane, and back to Milngavie by the old road. The weather was dull but fine. The dykes on the golf course furnished many mosses. Near the "Gowk Stane" Juniper *(Juniperus communis)* claimed attention, and the Redstart *(Ruticilla phœnicurus)* was seen near Strathblane. Mr. D. A. Boyd supplies the list of plants which follows:—*Apium inundatum*, *Gymnadenia conopsea*, *Antennaria dioica*, *Tilletia decipiens*, *Sedum villosum*, *Carex ampullacea*, *C. paludosa*, *C. hirta*, *Scirpus sylvaticus*.

Glen Douglas to Whistlefield, August 18th, 1906.—Mr. John R. Lee, conductor.—A party of ten members travelled to Glen Douglas Passing Place, on the West Highland Railway, where a special stop was made. Crossing the moor to the west of the railway line, the party descended by the Glen Douglas Road to the main road from Arrochar to Helensburgh, running along the eastern shore of Loch Long, which road was then followed to Whistlefield. The weather was excellent, and the magnificent mountain scenery of Loch Long was seen to perfec-

tion. From the hill side, shortly after leaving the railway, a fine view of the slopes of Ben Arthur and Ben Narnain was obtained, as also of the rugged rocks which compose the crowns of these two mountains. Immediately to the south of Ben Arthur the Glen Croe Burn enters Loch Long, and at its mouth stands Ardgartan House and Policies, where a heronry has been known to exist for many years. Immediately behind Ardgartan, and forming the southern boundary of Glen Croe is the Brack, a wild hill with high precipitous crags, and deep scars, especially on its northern face, which, although greener and softer in aspect on the side facing Loch Long, yet presented an imposing feature in the panorama which lay before the party as they descended towards the loch side. The point at which the main road was joined lay a short distance south of Morlaggan, almost exactly opposite which, on the western side of the loch, is Coilessan Farm, situated at the foot of the Coilessan Burn, which marks the northern boundary of Glasgow's new "estate" of Ardkinglas. This wild stretch of hill country was, therefore, within view of the party during the whole of the afternoon, and the members had ample opportunity of judging of the rugged nature of the mountains which, with a unique sense of proprietorship, we now designate as "ours." Let us hope that "the powers that be" will, in their wisdom, decide to leave nature alone in her grandeur; for assuredly nothing that even a Glasgow Corporation can do will *improve* the glory of Argyll's Bowling Green.

The road leaves Loch Long side at the entrances to the policies of Finnart and Ardarroch, from which point a short walk uphill leads to Whistlefield, where a beautiful view is obtained of the entrance to Loch Goil.

Little of special interest in any department of natural history falls to be recorded from this excursion, but the members present interested in botany felt that the district would amply repay a fuller investigation with more time at their disposal. Specimens of *Hieracium boreale*, Fr., were gathered in the woods near Finnart, and an abundance of *Milium effusum*, L., was noted along the roadside in the shade of the trees.

The following mosses were collected:—*Dicranum scoparium*, Hedw.; *Ditrichum homomallum*, Hampe.; *Campylopus fragilis*, B. and S.; *Dichodontium pellucidum*, Schp.; *Blindia acuta*

B. & S.; *Swartzia montana*, Lindl. (on roadside at Ardarroch); *Fissidens adiantoides*, Hedw.; *Grimmia maritima*, Turn.; *Zygodon Mougeotii*, B. and S.; *Breutelia arcuata*, Schp. (fertile) *Hypnum exannulatum*, Gümb.

Proceedings of the Society.

SESSION 1905-1906.

26th September, 1905.

Mr. Peter Ewing, F.L.S., President, in the chair.

A report on an excursion to West Kilbride and Fairlie (p. 86) was read.

Mr. J. Bruce Hunter exhibited a specimen of the Globe Fish, (*Gymnodontes tetraodon*, Linn.) from Port Said. Mr. Robert Garry, B.Sc., exhibited under the microscope the following algæ, viz.:—*Zygnœma stellinum*, Vauch., in Zygospore, from Glen Rosa, Arran, and *Œdogonium* (sp.?) from Dalry and Balgray Dam. Mr. Garry also exhibited many microphotographs of the structure of these algæ.

Mr. R. S. Wishart, M.A., exhibited and described from Crail *Astragalus hypoglottis*, Linn.; *Thalictrum minus*, Linn.; *Geranium sanguineum*, Linn.; *Ligusticum scoticum*, Linn.; *Caucalis nodosa*, Scop.; *Agrimonia odorata*, Mill., &c.

Mr. Peter Ewing exhibited a number of alpine plants from the mountains round Killin.

Mr. R. Buchanan showed a series of the young of the commoner species of Charadriidæ in down.

Mr. Wishart exhibited the Magpie Moth in its different stages, and gave an account of the destruction done by this species on the shrubs in his garden at Stepps, and of the ineffective attempts he had made to stay its ravages.

Mr. A. Patience read a paper on "The genus Idothea" (p. 42).

24th October, 1905.

Mr. Peter Ewing, F.L.S., President, in the chair.

This was the Society's Fifty-fourth Annual Business Meeting, and the usual Reports were submitted.

Meetings.—Ten Ordinary Meetings and one Special Meeting were here held during the Session. These were well attended.

Excursions.—A programme of excursions was carried out as usual during summer, but, as last year, the attendances were not satisfactory.

Membership.—This is as follows:—

Honorary Members, - - - - -	17
Corresponding Members, - - - -	38
Ordinary Members, - - - - -	227
Associates, - - - - - - -	11
	293

Eleven members resigned and nine members were elected during the Session. The Rev. G. A. Frank Knight, M.A., F.R.S.E., having resigned the Hon. Editorship of the *Transactions*, Mr. John Paterson was appointed his successor.

Finance.—The Hon. Treasurer's (Mr. John Renwick) Statement of Account was submitted, duly audited. It showed a balance of £135 15s. 7d. at the credit of the Ordinary Fund, and £157 10s. at the credit of the Life Members' Fund (page 113).

Library.—The Hon. Librarian (Mr. James Mitchell) reported that 230 volumes were issued during the year, and 24 volumes had been presented to the Library during the year. The books in the Library are in good condition.

Transactions.—The Hon. Editor (Mr. John Paterson) reported that the part of *Transactions* and *Proceedings* for 1903-4 was in the press, and would be issued shortly. The part for 1904-5 would be proceeded with at once.

Vacancies among the Office-bearers and Council were filled up as follows:—

As President—Mr. D. A. Boyd.

As Vice-President—Mr. J. Ballantyne.

As Hon. Secretaries—Dr. Robt. Brown and Alex. Ross.

As Hon. Treasurer—Mr. John Renwick.
As Hon. Librarian—Mr. James Mitchell.
As Hon. Editor of *Transactions*—Mr. John Paterson.
As Members of Council—Messrs. Alex. Patience. John R. Lee, P. Ewing, F.L.S., Archd. Park.
Messrs. Joseph Somerville and James Jack were re-appointed as Auditors.

The Secretaries were instructed to write to the Rev. Mr. Knight and thank him for his services as Editor of the Society's *Transactions*.

Mr. Thomas Anderson, 40 Holmscroft Street, Greenock, was elected an Ordinary Member, and Mr. G. A. Hardy, 11 Windsor Terrace, St. George's Road, an Associate.

Mr. D. A. Boyd read a Report on an excursion to Johnstone Castle.

Mr. P. Ewing, F.L.S., the retiring President, delivered his valedictory address, taking as his subject "Variation." Mr. Ewing carefully stated the different theories which have been put forward in explanation of variation, and gave a special *résumé* of the work of Mendel and de Fries.

28TH NOVEMBER, 1905.

Mr. D. A. Boyd, President, in the chair.

Miss Jane Adelaide Cathcart, of Old Auchendrane, Alloway, Ayr, was elected as an Ordinary Member.

Mr. John Renwick, on behalf of Miss Cathcart, of Old Auchendrane, presented to the Society two photographs of trees on her estate, a Birch and a Scots Fir. Particulars relating to these trees will be found in these *Transactions*, Vol. VII. (N.S.), pp. 262-9. It was agreed to send to Miss Cathcart the thanks of the Society for her gift.

Mr. R. M. Buchanan exhibited the down of several species of the Anatidæ, and, referring to the part played by down during incubation, expressed the opinion that, but for this wonderfully-efficient heat retainer, ducks would be seriously handicapped in the struggle for existence.

Mr. Robert Wilson showed a Grey Plover (*Squatarola helvetica*), got at Fairlie recently. This bird is one of the rarer Arctic

waders, of which till this year few occurrences were known in Clyde. In the list of the birds of Clyde compiled by Mr. John Paterson for the British Association meeting in 1901 in Glasgow, the species is described as "Very r.[are]. Mr. Chas. Berry, Lendalfoot, Ayr, has seen it twice or thrice, and has one which he shot. Mr. John Robertson has recorded one recently from E. Renfrew." (*Handbook on the Nat. Hist. of Glasgow*, &c., p. 167.) Since that time the following occurrences fall to be noted:—Two observed in Bute in 1904 by Mr. John Robertson, and three seen flying over Brigaird Spit, Fairlie, in September of that year by Mr. Wilson; two observed on several dates in September and early October, 1905, at Troon, by several Glasgow ornithologists; two at Brigaird Point, Fairlie, seen on 21st October, 1905, by Mr. J. C. Murphy and Mr. Wilson; and last the bird exhibited at this meeting, shot by a gunner at Fairlie.

Through the kindness of Messrs. M'Culloch & Sons, Mr. Wilson exhibited further a Semi-albino Wheatear (*Saxicola œnanthe*), and albino forms of the Blackbird (*Turdus merula*), Tree-Pipit (*Anthus trivialis*), and Fulmar Petrel (*Fulmarus glacialis*), the last named being from St. Kilda.

A specimen of the Pine-Marten (*Mustela martes*) from North Wales was sent for exhibition by Messrs. M'Culloch & Sons.

Through the kindness of Mr. W. Eagle Clarke, F.L.S., F.R.S.E., M.B.O.U., Mr. John Paterson exhibited two specimens of the Greenland Redpoll (*Acanthis hornemanni*). The skins were much admired, but Mr. Clarke, in sending them, wrote that they were still more beautiful in the flesh, when the pale rose-tint pervaded the white parts.

Mr. Robert Service, M.B.O.U. read a paper on "The Waders of Solway" (p. 46).

Part II., Vol. VII. (N.S.) of the Society's *Transactions* was laid on the table.

26th December, 1905.

Mr. D. A. Boyd, President, in the chair.

Mr. W. E. Agar, B.A., 10 Caird Drive, Partickhill, and Professor Leonard A. Lucas King, B.A., 8 Ardgowan Terrace, Sandyford, were elected as Ordinary Members.

Mr. W. W. Scott, 180 Sauchiehall Street, was elected as an Associate.

Mr. John Paterson exhibited, per favour of Mr. W. Eagle Clarke, F.L.S., M.B.O.U., &c., a pair of Lapland Buntings (*Calcarias lapponicus*) ♂ and ♀ from the Fair Isle. Mr. Paterson also exhibited for Mr. Charles Kirk, a hybrid between a Black Grouse (♂) and Red Grouse (♀) from Kintyre.

Mr. R. S. Wishart, M.A., exhibited *Artemisia maritima*, Linn., and *A. Absinthium*, Linn., from Crail, and for comparison *A. vulgaris*, Linn., from Chryston, and read a paper entitled "Appleringie" (p. 22).

Mr. James F. Gemmill, M.A., M.D., communicated, on behalf of Mr. E. S. Russell, a paper "On the occurrence of *Gonactinia prolifera*, Sars., in the Firth of Clyde" (p. 27).

On behalf of the Rev. David Landsborough, LL.D., Mr. John Renwick read a paper on *Cordyline australis*, the Palm Lily, based on specimens grown in the open air at Campbeltown, Argyll (p. 60).

Mr. John Paterson read a note on the occurrence of the Black Redstart (*Ruticilla titys*) in a field on the north side of the Great Western Road, Glasgow, on 19th November, 1905. It was observed by Mr. Wm. Wordie, M.A., a member of this Society, who knows the bird from having seen it in its Swiss haunts. This species has not hitherto been recorded as occurring in the "Clyde" area.

30th January, 1906.

Mr. J. Ballantyne, Vice-President, in the chair.

Professor J. Graham Kerr exhibited and gave some notes on certain specimens of general zoological interest (p. 5).

Mr. John Robertson exhibited, for Mr. Henry M'Culloch, a Green Sandpiper (*Totanus ochropus*), and gave particulars of what is known of it in this district. Only five occurrences in the "Clyde" area are known, three in Renfrewshire, one in Dumbartonshire, and one in Stirlingshire. The first was on 10th November, 1868, when two birds were seen in company at Nether Pollok, and one was shot by Mr. Cox, head keeper, there. It was

not again observed in "Clyde" until 1894, when Mr. Ripley Ker shot one at Dougalston, Milngavie, Stirlingshire, on 8th December. Again, on 11th December, 1904, one was observed by Messrs. Robert and Hugh Wilson at an old clay pit near the village of Hangingshaw in the south-east corner of Glasgow. Mr. Robertson saw one on 15th April at the pond at the head of the Rouken Glen, Glasgow's new Public Park, and about 9th December the specimen which he now exhibited was shot by Mr. Campbell Colquhoun at Garscadden, Dumbartonshire. Only one of these records, it may be noted, is in the spring-time. Mr. Robertson also exhibited, on behalf of Mr. Henry M'Culloch, a Velvet Scoter (*Œdemia fusca*) from the Outer Hebrides, and a hybrid between the Capercaillie and Blackcock.

Professor T. Graham Kerr read a "Note on the Pelagic Fauna observed off the West Coast of Arran during the months of August and September, 1905 (p. 1).

Professor Malcolm Laurie, D.Sc., F.R.S.E., F.L.S., delivered a lecture on "Scorpions and their Allies," and with the aid of lantern slides gave a description of the peculiar anatomical and physiological structures of the Scorpion proper, comparing them with other genera of the Arachnida.

27TH FEBRUARY, 1906.

Mr. D. A. Boyd, President, in the chair.

Mr. T. Beath Henderson, M.D., exhibited an Indian Snake (*Eryx conicus*, Duméril and Bibron), which had been brought from India to the Glasgow "Zoo," and died there. Dr. Henderson demonstrated his method of diagnosing the generic and specific relationship of his specimen, and gave an account of its external peculiarities.

Mr. John Robertson read a paper entitled "Notes on the Nesting Dates of some of the Waders (*Charadriidæ*)" (p. 62).

Mr. D. A. Boyd exhibited specimens of *Neckera pumila*, Hedw., from Strachur and St. Catherines (Lochfyneside) and Daljarrock (South Ayrshire), and *Petrogonium gracile*, Sw., from the sea shore at Largs and Little Cumbrae.

Professor David Ellis, D.Sc., Ph.D., delivered a lecture on Microbes, which was illustrated by lantern slides.

27th March, 1906.

Mr. D. A. Boyd, President, in the chair.

On behalf of Mr. Thos. G. Bishop, Mr. Anderson Fergusson exhibited the following Coleoptera from Rannoch:—*Liodes castanea*, Herbst., taken in dry powdery fungi in firs; *Cetonia floricola*, Herbst., found on cossus-infested tree; *Thanasimus formicarius*, Linn., under bark; *Acanthocinus ædilis*, Linn. taken in Scots fir stumps; *Lamia textor*, Linn., and *Pissodes pini*, Linn., taken in firs. Mr. Fergusson also exhibited *Stenolophus plagiatus*, Gorham, taken near Gourock by the late John Dunsmore, of Paisley. The species was described by Gorham from the specimen exhibited, and another from the South of France in the British Museum.

Mr. T. B. Henderson, M.D., exhibited two Water Snakes, (*Hypsirhina macleayi*, Boulenger, and *Cerberus rhyncops*, Günther) from the University Museum, describing the specimens and giving an account of the habits of each.

Mr. William Hunter sent for exhibition specimens of the Sea or Maldive Double Cocoanut, "Coco de mer" (*Lodoïcea callipyge*, St. Hie; *L. seychellarum*, Lab.), from the Seycbelles.

Mr. Robert Brown, M.D., read a paper on "Zermatt and its Flora," illustrated by a variety of the rarer specimens personally collected.

Mr. Robert Henderson read a paper entitled "List of Additions to the Diptera of the Clyde Faunal Area" (p. 7).

Mr. D. A. Boyd exhibited *Dicranella schreberi* (Sw.), Schp., var. *elata*, Schp., a moss from the neighbourhood of Pinmore, Ayrshire.

Mr. P. Ewing, F.L.S., as delegate to the British Association Meeting, read his report of what was done at the meetings held in the Linnean Society's Rooms on the 30th and 31st October last.

24th April, 1906.

Mr. D. A. Boyd, President, in the chair.

Mr. T. Beath Henderson, M.D., exhibited, on behalf of Mr. Keith Buchanan, a skin of *Python Sebae*, Duméril and Bibron, which measured 15 feet 10½ inches, though wanting the head and part of the tail. He also showed a specimen of the Australian

Stump-tailed Lizard (*Trachysaurus rugosus*), Gray, and gave an interesting account of its structure and habits. For Mr. Wm. Hunter, Dr. Henderson further exhibited one of the Sea Snakes (*Hydrus platurus*, Boulenger, "Cat. Snakes," British Museum), and compared it with young specimens of *Platurus colubrinus*, Girard, brought by himself.

Mr. A Somerville, B.Sc., F.L.S., exhibited, for Dr. T. F. Gilmour, the Purple Mountain Saxifrage (*Saxifraga oppositifolia*) from rocks at sea-level on the coast of Islay, and read a paper on the subject (p. 71).

Mr. Alexander Patience read a paper entitled "Some Notes on the distribution of the Clyde Crangonidæ" (p. 64), and exhibited some of the species referred to.

Mr. Robert Henderson contributed a paper "On Some Household Flies," which, in his absence, was read by Mr. Alex. Ross. In this paper Mr. Henderson mentioned that in a country house something like seventy-two different species had been recorded. He, however, excluded all that were casual or accidental, and confined himself to eight species, which in our district might be considered household species or pests. Seven of these belonged to the family Muscidæ, and one to the family Anthomyidæ. He dwelt in detail on each of these species, giving a general description of their appearance and habits. He pointed out as worthy of note that these flies were, in all cases, invaders, none of them were home bred, but all had spent their early life and passed through their metamorphoses out of doors. It would, indeed, be a disgrace to our civilisation if the interior of our houses afforded any suitable breeding ground for these creatures, whose larvæ are all nurtured among refuse matter. These larvæ formed, however, the great scavengers of the earth, and their labours in this stage of their life contributed in no slight degree to the purity of its atmosphere. With regard to the duration of life of the perfect fly, Mr. Henderson said it was hardly possible to speak definitely. It would appear, however, to be longer than that of the larvæ and pupa, except where these exist through the winter. The paper was illustrated by specimens of the flies mentioned.

Mr. James Bartholomew, Kinnelhead, Beattock, was elected as an Ordinary Member, and Miss Margaret A. Kennedy, 7 Howard Street, Kilmarnock, as an Associate

29TH MAY, 1906.

Mr. D. A. Boyd, President, in the chair.

Mr. Boyd read a notice of one who had died lately and had been for long a member of this society, Mr. James Barclay Murdoch, of Capelrig. Mr. Murdoch had at one time been a Vice-President of the Society. It was agreed to send an expression of sympathy to Mr. Murdoch's widow and family in their bereavement.

Reports were submitted on excursions to Doonholm, &c. (p. 88); Harelaw Dam (p. 94); Blackshaw, at West Kilbride (p. 94); and the west side of the Gareloch (p. 95).

Mr. A. W. Campbell, Mossbank, Millerston, was elected an Ordinary Member, and Miss Dorothy Beath Henderson an Associate of the Society.

Mr. Robert Henderson exhibited a fly (*Drynyia hanata*), with adherent pollinia of orchis, and explained the prevailing belief that flies were too stupid to manipulate the corollas of plants in the interest of cross-pollination. He showed, however, by a careful examination of this fly that it was peculiarly fitted by special organs for this purpose, and he was, he said, under the impression that many other species would be found equally suited for the purpose.

Mr. T. B. Henderson, M.D., exhibited and described *Draco spilopterus* (Duméril and Bibron).

Mr. Richard M'Kay exhibited the Toothwort (*Lathræa Squamaria*). The plant shown was parasitic on the Lime (*Tilia*) at Doonholm, Ayr. Mr. M'Kay also showed an example of "Witches' Broom" (*Ecidium elatinum*) on the Silver Fir (*Picea pectinata*) from Doonholm.

Mr. Alex. Ross, for Mr. J. E. Murphy, exhibited the moths and some of the cocoons dealt with in a paper by Mr. John Smith on "Cocoons of some British Moths."

In the absence of Mr. Alexr. Patience, a paper "On the occurrence of *Gobius orca*, Collett, within the Clyde sea area" (p. 74) was read by Mr. Alexr. Ross.

Mr. John Robertson read a paper on "The Common Sandpiper (*Totanus hypoleucus*)" (p. 77), and a note on the "Little Stint (*Tringa minuta*) at Balgray Reservoir" (p. 76). Mr. D. M'Kenzie exhibited a Cowslip, showing fasciation, and Mr. P. Ewing, F.L.S., a specimen of *Sium erectum* collected by Mr. Gilbert Hamilton, Jun., near Abington.

26TH JUNE, 1906.

Mr. D. A. Boyd, President, in the chair.

Reports were submitted on excursions to Ashgrove Loch, Stevenston; Mount Stuart (p. 96), Glengarnock Castle and Ladyland (p. 97), and Sorn (p. 99).

Mr. John R. Lee exhibited *Cornus suecica* from Ben Vorlich, Dumbartonshire. Mr. Lee stated that, as far as he knew, this was a new record for that district.

Mr. T. B. Henderson, M.D., exhibited and described three species of Coral Snake from South America. The species were *Elaps corallinus*, Wied., *E. marcgravii*, Wied., and *Ilysia scytale*, L.

By favour of Mr. Fenton of the Pharmacy College, Mr. Wm. Stewart exhibited specimens of the rare fungus *Agaricus* (*Lepiota*) *rachodes*, Vitt., from the Forfarshire Grampians, found inside a dilapidated hut and growing on the rush thatch, supported on larch branches. Unfortunately the specimens, while abnormally large, had been attacked by another fungus—one of the moulds—and did not show the beauty of the genus nor the characteristics of the species. Mr. Stewart also showed *Agaricus* (*Lepiota*) *cristatus*, A. and S., from the mossery of the Botanic Gardens for comparison. He further exhibited *Lentinus lepideus*, Fr., gathered by Mr. Robert Dunlop in New Zealand, South Island, which seems identical at any rate with the British species. Mr. Stewart concluded his exhibition by showing several examples of a rare local species, *Agaricus* (*Psaliota*) *echinatus*, Roth., which has appeared for several years on the ground among the tree-ferns in the Kibble Palace. The pileus is about $2\frac{1}{2}$ ins. broad, of a light fawn colour, curiously wrinkled, and the gills and stem cinnabar purple. There seems to be considerable diversity of opinion concerning it. Berkeley, followed by Stevenson, has placed it among the *Psaliota*, considering the colour of the spores purple. Massee has it among the *Inocybe*, calling the spores pale yellow, with a red tinge; while Worthington Smith, in *Clavis Agaricinorum*, has created a new sub-genus for it and two other species—*Chamœota*—calling the spores pale rose. This is a most interesting plant, and, as Berkeley gives only two records and Massee one, while Stevenson has none, it seems worthy of further examination.

Miss Zamorska exhibited a fresh specimen of *Medicago denticulata*, Willd., from Cardross.

Mr. Alexander Patience read a paper entitled "On some Terrestrial Isopods new to the Clyde Faunal Area, and some Notes on the Distribution of the Rarer Species" (p. 80).

Mr. Edward J. Bles, B.A., B.Sc., F.R.S.E., gave an address on "A Card Catalogue Record of the Local Fauna," and exhibited at the same time documents from the Cambridge Entomological and Natural History Society bearing upon a proposition to form such a catalogue, and describing the methods which might be adopted to make the scheme practicable and of value to science.

1904.—Sept. 1.						
To Balance—Life Members' Fund,						
Debentures, - -		£81	5	0		
Do., on loan at 4 per cent., - - -		76	5	0		
		£157	10	0		
Ordinary Fund, on loan,	£10 15 0					
Do., in Bank, and in Treasurer's hand,	123 4 3					
		133	19	3		
					£291	9 3
1905.—Aug. 31.						
To 146 Members' Annual Subscriptions, @ 7s. 6d.,					54	15 0
,, 23 Members' Arrears, - - - - - -					9	15 0
,, 7 Associates' Subscriptions, @ 5s., - -					1	15 0
,, 1 Associate's Arrears, - - - -					0	5 0
,, Interest, - - - - - - - -					8	19 7
,, Reprints, - - - - - - - -					0	10 9
,, *Transactions* to Mitchell Library, 2 years, -					9	13 6
,, Donation to Illustration Fund, - - -					0	7 0
					£377	10 1

From Balance of £135 15s. 7d. fall to be deducted cost of *Transactions* for 1902-1903, for 1903-1904, and for 1904-1905.

1905.—Aug. 31.						
By Rent and Attendance, - - - -					£13	5 0
,, Postage, Stationery, &c., - - - -					11	17 9
,, Printing Circulars, - - - - -					11	7 0
,, Printing *Transactions*, 1901-1902, - -					29	5 8
,, Carriage on *Transactions*, - - - -					0	12 6
,, Library—New Books, - -		£7	0	6		
Insurance, - - -		0	12	0		
Binding, - - -		5	4	4		
					12	16 10
,, Lecture and Lantern Expenses, - - -					3	18 9
,, Donation to Marine Biological Association,					1	1 0
,, Balance—Life Members' Fund, Debentures of the Modern Permanent Building and Investment Society, Melbourne,		£75	0	0		
Do., on loan @ 4%, -		*82	10	0		
		£157	10	0		
,, Balance, Ordinary Fund, on loan @ 4%,	*£4 10 0					
,, Balance, Ordinary Fund, in National Security Savings Bank, and in Treasurer's hand,	131 5 7					
		135	15	7		
					293	5 7
					£377	10 1

*On Security of Guaranteed Railway Stock.

GLASGOW, 16*th October*, 1905.—We have examined the Accounts, and compared same with the relative Vouchers and Securities, and find them correct. Cash in Treasurer's hand, Ten pounds Five shillings and Sixpence.

(Signed) JOSEPH SOMMERVILLE, JAMES JACK, } *Auditors.*

On the occurrence of the Rock-Samphire, *Crithmum maritimum*, L., and the Marsh Helleborine Orchis, *Epipactis palustris*, Crantz, on the West of Scotland.

By Alex. Somerville, B.Sc., F.L.S.

[Read 26th March, 1907.]

It is of interest that we are able to bring before the Society two plants, neither of them minute or inconspicuous, one of them tall and striking, which, during the past summer, were met with on the Island of Colonsay, one of the South Inner Hebrides, where they proved to be practically additions to the known flora of the West of Scotland. Of these, one is an Umbelliferous Dicotyledon, and the other an Orchidaceous Monocotyledon.

We shall refer in the first place to the former, the Rock-Samphire, *Crithmum maritimum* of Linnæus, which has been known as British since 1548, or for 360 years, a plant whose habitat is rocks and rocky cliffs by the sea, and which has been recorded hitherto from 26 out of the 112 vice-counties of Great Britain, only a single addition (that of East Suffolk) having been made to their number since the issue of *Topographical Botany* in 1883.

Crithmum is a plant well distinguished by its long entire fleshy leaflets, which are glaucous in appearance, cold to the touch, and have an aromatic scent.

The young leaves, gathered in May, make, when sprinkled with salt and preserved in vinegar, the well-known pickled condiment. From this we can gather that though *Crithmum* belongs to the Hemlock Order, it is not in itself poisonous.

The inflorescence, or arrangement of the flowers on the flower-stalk, is, as will be seen from the specimens shown, a compound, many-rayed, flat-topped umbel, consisting of an assemblage of small, stalked, yellowish-white flowers, with numerous bracts and bracteoles; the fruits, known as cremocarps, having thick primary ridges and many vittæ; the whole plant differing much from all the other British *Umbelliferæ*, of which there are about seventy.

In Scotland, *Crithmum* is both rare and local. It comes near the truth to say that it has of late been much restricted to a part of the Wigtownshire coast—the Rinns of Wigtown, that long, narrow peninsula which stretches south and ends in the headland known as the Mull of Galloway.* By Professor Trail, in his *Topographical Botany of Scotland*, two East-Coast counties are given for *Crithmum*—Midlothian and Fife—but they are double-queried in both cases, indicating decided doubts as to the correctness of any East-Coast records. Coming west, the counties named both by Hewitt Cottrell Watson and by Professor Trail are Kirkcudbright, Wigtown, and Ayr. From Watson's *Topographical Botany of Great Britain* (1883) we know that a Kirkcudbright specimen was shown to Watson by Boswell Syme, editor of Sowerby's Botany, 3rd edition, and as regards Ayrshire, that *Crithmum* is included by the late Rev. James Duncan (died 1861), whose Catalogue of Ayrshire plants was treated by Watson as reliable, no Ayrshire station, however, being given for *Crithmum*. Mr. Ewing, in his *Glasgow Catalogue of Plants*, includes *Crithmum* for Ayrshire, but does not say where or by whom it was found.

That our plant should have made its way so far north as to Colonsay, where, on the western side of the island, it was last year met with, growing in a compact mass two square yards in extent, just at high-water mark, and among very savage, large, broken rocks, was interesting, as it extends the plant's geographical range a good way further up the British coast, indicating that there is room for the discovery of other plants with which the higher latitude would not disagree.

There is but one species of the genus *Crithmum* known to science, this of ours, and its distribution, according to Bentham, is the Atlantic coasts of Europe and Northern Africa, extending along the Mediterranean to the Black Sea.

It is abundant in Southern and Western England, and, as Mr. F. H. Davey states in his new *Tentative Flora of Cornwall*, it occurs all round the Cornish coast. It is to be found also in Ireland, principally in the south, and the author of this paper met with it in 1901 on the Kenmare River, on the coast of County Kerry.

* It has been found, however, at Burrow Head, across Luce Bay from the Rhinns, by Messrs. Paterson, Mackenzie, and Robertson, Glasgow, about ten years ago.

To other two British plants the name of Samphire has been given, namely to the Glasswort, *Salicornia herbacea*, called the Marsh-Samphire, a succulent, shore-loving plant known to most of us; and secondly, to the Golden Samphire, *Inula crithmoides*, a rather striking composite, occurring along the English Channel and in the Channel Islands, and, somewhat remarkably, recorded also as having been met with, in years past, in the South of Scotland, in Wigtown and Kirkcudbright.

The plant under notice, the Rock-Samphire, is distinguished by having been named in Shakespeare's Play, *King Lear* (Act iv. 6. 15), and up till not many years ago used to be gathered on the Dover Cliffs, on what was known as Shakespeare's Day.

The poet supposes that Edgar is leading Gloucester along, and says—

"Come on, sir; here's the place: stand still. How fearful
And dizzy 'tis, to cast one's eyes so low!
The crows and choughs that wing the midway air
Show scarce so gross as beetles: half way down
Hangs one that gathers samphire, dreadful trade!"

In many Scotch Libraries, private as well as public, there is to be found a former "Flora" of this northern division of the kingdom. I refer to the *Flora Scotica* of Lightfoot, published in 1777, now 130 years ago. In this work we are informed of the finding, in Kilmuir Parish, in the Island of Skye, in bogs near Duntulm Castle there, of that distinguished-looking plant among botanical aristocrats, the Marsh Helleborine Orchis, *Epipactis palustris* of Crantz, known previously as *Serapias longifolia*, to which we are now to refer. The only record of the plant from the West of Scotland seems to have been this of Lightfoot's, and we do not learn that anyone has found it since his time, or at least has recorded it as occurring in that quarter.

To the satisfaction of the valued botanical referee, our Corresponding Member, Mr. Arthur Bennett, F.L.S., this plant was, at the end of July last, met with growing in an evidently suitable situation in the south-west corner of the Island of Colonsay, on damp, almost marshy, sandy grass-land, well back from undulating dunes lying along the sea-coast. There were

altogether some ten specimens, several not being likely to flower that year.

In the immediate neighbourhood were large quantities of the greater Twayblade, *Listera ovata*, R. Br., and abundance also of *Orchis pyramidalis*, L., with which we in Scotland have but little acquaintance, together with the more widely-distributed Fragrant Orchis, *Gymnadenia Conopsea*, Benth., with its rich pungent odour.

The circumstance of this striking plant (the *Epipactis*) appearing where it did is, as Mr. Bennett remarks, odd, when one comes to look at its European, and especially its Scandinavian distribution, and I cannot help thinking, he adds, that it will be found in one of the other isles between Colonsay and Skye; and, judging from analogy, I should have said it would be more likely to occur in the West of Scotland than in the East.

That *Epipactis palustris* is but a rare plant with us may be gathered from the fact that Professor Trail, in his *Topographical Botany of Scotland*, is only able to give it for three lowland counties on the east—Berwick, Haddington, and Midlothian; from Fife also, and from the three divisions of Perthshire, in all of which I believe it is a scarce plant.

In England it is widely distributed, and recorded as occurring in 59 of the 71 vice-counties. In Ireland, Mr. Praeger describes it as a characteristic plant of the Central Plain, thinning out in the north and east.

There are five British species of the genus *Epipactis*, several of them much alike; *palustris*, whose habitat is marshy ground, is about a foot high, with stem leafy, flowers few, the outer leaves of the perianth green, striped with red. Orchis plants most commonly rise from ovate or palmate tubers. Of *Epipactis*, however, and some other genera, *e.g.*, *Cephalanthera*, the rootstock is a fibrous and creeping one, well seen in *Cephalanthera ensifolia*, of which an Arran specimen is shown for comparison.

Microfungi observed in Islay.

By D. A. Boyd.

[Read 28th May, 1907.]

During the month of July, 1905, I spent about twelve days in Islay. Although a considerable amount of time each day during my visit was occupied in cycling from place to place, or in viewing archæological remains and other objects of interest, I was also able to devote some attention to the botanical features of the island. In the course of my rambles I had often the privilege of being conducted by Dr. Thomas F. Gilmour, Port Ellen, whose keen enthusiasm and ready stores of scientific information rendered these occasions much more pleasant and profitable than they would otherwise have been.

When contrasted with the other islands of the Hebridean group, Islay is seen to possess features peculiarly its own. Although it lacks the grandeur of outline characteristic of Arran and Skye, its scenery is so varied, and affords so great a diversity of conditions favourable to plant life, as to render its exploration a source of unfailing enjoyment. Besides presenting the general features common to most of the larger islands of the group, Islay is notable for the comparatively great extent of ground which has been put under cultivation, cropped regularly from year to year, and brought to a state of fertility highly creditable to the intelligent skill of the local farmers. The flora is therefore more varied, by the occurrence of a larger number of weeds of cultivation, than is usual among the other western islands.

Besides the places where my observations were chiefly made, there are many others which would doubtless yield a rich and varied harvest of cryptogamic plants if carefully explored, especially in late autumn. Among such places which await examination may be mentioned the moist woods around Kildalton, Bridgend, and Port Askaig; the extensive tracts of peat moss and stretches of sandy shore between Port Ellen and Bowmore; and the numerous lochs and marshes which occur throughout the island.

As very little information regarding the mycology of the Hebrides has been placed upon record, the following fragmentary list of Microfungi observed in Islay is offered, in the hope that it may not only possess some interest as a first contribution to the subject to which it relates, but may have the effect of stimulating further research in the same and kindred directions:—

Cystopus candidus (Pers.) Lév.—On *Capsella Bursa-pastoris;* Port Ellen.

Bremia lactucæ, Regel.—On *Senecio vulgaris;* The Ard.

Peronospora urticæ (Lib.) De Bary.—On *Urtica urens;* Port Ellen.

P. viciæ (Berk.) De Bary.—On *Pisum sativum;* Ardbeg.

P. alta, Fckl.—On *Plantago major;* Port Ellen, &c.

Ustilago avenæ, Jensen.—On *Avena sativa;* Port Ellen, &c.

Tilletia decipiens (Pers.) Winter.—On *Agrostis vulgaris;* Kilbride, Kildalton, &c.

Protomyces macrosporus, Ung.—On *Ægopodium Podagraria;* The Ard, &c.

Uromyces limonii (D.C.) Winter.—As *Uredo;* on *Armeria* in garden; Kildalton.

U. polygoni (Pers.) Fckl.—As *Uredo;* on *Polygonum Aviculare;* Kilbride.

U. trifolii (A. & S.) Winter.—As *Uredo;* on *Trifolium repens;* Port Ellen.

U. rumicis (Schum.) Winter.—As *Uredo;* on *Rumex Acetosa;* Port Ellen.

U. alchemillæ (Pers.) Winter.—On *Alchemilla vulgaris;* The Ard.

Puccinia galii (Pers.) Winter.—As *Uredo;* on *Galium verum;* Port Ellen.

P. calthæ, Link.—On *Caltha palustris;* Port Ellen, Upper Killeyan.

P. violæ (Schum.) Winter.—On *Viola Riviniana;* Middle Cragabus.

P. primulæ (D.C.) Winter.—As *Uredo;* on *Primula vulgaris;* Kildalton.

P. rubigo-vera (D.C.) Winter.—As *Uredo;* on *Holcus lanatus;* Kilbride.

P. poarum, Nielsen.—As *Æcidium;* on *Tussilago Farfara;* Port Ellen, &c.

P. suaveolens (Pers.) Winter.—As *Uredo;* on *Cnicus arvensis;* Port Ellen.

P. centaureæ, Mart.—On *Centaurea nigra;* Port Ellen.

P. oblongata (Link.) Winter.—As *Uredo;* on *Luzula campestris* and *L. maxima;* The Ard, Kildalton.

P. Baryi (B. & Br.) Winter.—As *Uredo;* on *Brachypodium sylvaticum;* Port Ellen.

P. Fergussoni, B. & Br.—On *Viola palustris;* Kildalton.

P. chrysosplenii, Grev.—On *Chrysosplenium oppositifolium;* Kildalton, Port Askaig.

P. valantiæ, Pers.—On *Galium saxatile;* Ardbeg.

Melampsora lini (Pers.) Winter.—As *Uredo;* on *Linum catharticum;* Kilbride.

M. betulina (Pers.) Winter.—As *Uredo;* on *Betula alba;* Kildalton.

M. pustulata (Pers.) Winter.—As *Uredo;* on *Epilobium palustre;* Kilbride.

Coleosporium tussilaginis, Lév.—On *Tussilago Farfara;* Port Ellen, &c.

C. euphrasiæ (Schum.) Winter.—On *Rhinanthus Crista-galli* and *Bartsia Odontites;* Port Ellen, Kilbride.

Lophodermium juniperinum (Fr.) De Not.—On dead leaves of *Juniperus;* maritime rocks near The Ard.

Ascomyces potentillæ, Farlow.—On *Potentilla Tormentilla;* Kilbride.

Podosphæra oxyacanthæ (D.C.) De Bary.—Mycelium on *Crataegus Oxyacantha;* Ardbeg.

Polystigma rubrum, Pers.—Imperfectly developed condition, as red crusts on living leaves of *Prunus spinosa;* Port Ellen.

Sphærella rumicis (Desm.) Cke.—On *Rumex obtusifolius;* Lagavulin.

Actinonema rosæ (Lib.) Fr.—On rose-leaves; Ardbeg.

Darluca filum (Biv.) Cast.—On uredospores of *Puccinia oblongata;* near The Ard.

Septoria hydrocotyles, Desm.—On *Hydrocotyle vulgaris;* Kildalton.

S. urticæ, Desm. & Rob.—On *Urtica dioica;* Port Ellen.

Melanconium bicolor, Nees.—On dead bark of *Betula alba;* Kildalton.

Oidium monilioides, Link.—On living grass-leaves; Lagavulin.

Tuberculariа vulgaris, Tode.—On a dead branch; The Ard.

Meteorological Notes and Remarks upon the Weather during the Year 1906, with its General Effects upon Vegetation.

By James Whitton, Superintendent of Parks, Glasgow

[Read 28th May, 1907.]

In order to preserve the continuity of the series, these notes have been compiled, as in former years, from the records kept at Queen's Park, Glasgow.

January.—The first day of the year was cold and dull, but dry. In the early hours of the morning slight showers of snow had fallen, but throughout the day was seasonable and enjoyable, despite the keenness of the easterly wind. These conditions continued until the afternoon of the 3rd, when heavy rain fell, and until the middle of the month the weather was changeable and stormy, with a considerable rainfall. On the 8th a thick watery fog enveloped the city for several hours. The latter half of the month was somewhat better than the earlier, though high winds were of frequent occurrence.

The changeable nature of the weather is well shown by the irregular and erratic line of atmospheric pressure. On the 1st the barometer indicated 29·70 inches, and on the 3rd, 29·20 inches; then, after varying several points up and down for several days, there was a sharp decline to 28·80 inches on the 9th. After quickly rising to 29·60 inches on the 11th, the pressure kept within a few points of that figure for several days, then from 29·25 inches on the 18th it rapidly rose to 30·00 inches on the 19th, and to 30·30 inches on the 22nd. Then the pressure declined to 29·40 inches on the 25th, after which date it again increased, till on the 31st it indicated 30·00 inches.

The rainfall was above the monthly average, 4·74 inches being registered, while there were only 8 dry days. In the corresponding month of 1905 the rainfall was only 1·78 inches, with 15 dry days.

The maximum (day) temperature was 43°, and the minimum (night) temperature was 37°, compared with 43° and 35° respectively in the same month in 1905, and also in 1904. The higher minimum may be accounted for by the absence of severe frosts, as only 9°, occurring on four days, were registered, whereas in the two preceding Januarys there were 33° frost on nine days and 28° on eight days respectively.

Consequent on the absence of hard frost and drying winds, vegetation looked remarkably fresh for the season, the grass lands being wonderfully clean and bright. Snowdrops were noticed in bloom on the 25th, while narcissi and winter aconites *(Eranthis hyemalis)* were in active growth, while those early-flowering rhododendrons, *Rhododendron præcox and R. nobleanum*, were expanding and showing the colour in their bloom buds, and the buds of the goat-willow swelling fast, in the last week of the month.

February.—For a few days there was a continuance of the same moderately changeable weather which marked the closing days of January. Then the weather became colder and more wintry-like; sharp frosts occurred on the 4th and 5th. The 8th was a wet, stormy day, and on the morning of the 9th there was a fall of snow—which, however, did not lie long, as rain followed—and the forenoon of the 10th was very wet and disagreeable. Frost again set in, and on the 13th and 14th snow and sleet showers were frequent. The weather became more settled, and after the 19th was drier and colder—with some fogs in the city—until the 24th, when another change occurred, and that night and following day were very wet and stormy. These conditions continued with some severity till the end of the month.

The severe and rapid changes of the weather are well shown by the wide and erratic range of the atmospheric pressure. On the 1st the barometer indicated 29·80 inches, while on the two following days it was three points lower. On the 4th the pressure had risen to 30·00 inches, and kept near that point until the 7th, after which date there was a rapid decline to 28·50 inches on the 10th, when a spell of stormy weather was experienced. The rise thereafter was fairly regular, until on the 21st it had again reached 30·00 inches. Another change

set in, and the pressure again rapidly declined to 28·80 inches on the 25th, after which it rose, till on the 28th it reached 29·40 inches.

Including melted snow, the rainfall amounted to 2·83 inches, which is slightly in excess of the amount (2·51 inches) registered in the previous February. There were 10 dry days.

In regard to the average temperatures—maximum, 42°, and minimum, 30°—these, compared with 45° and 34° in 1905 and 41° and 32° in 1904 respectively, were somewhat low, owing to the amount of frost registered during the month. Frost occurred on 19 days, to the total of 92°, whereas in 1905 the amount for February was only 35° on 11 days. The lowest readings were 22° on the 5th, 20° on the 12th, and 22° on the 24th.

The cold weather had its natural effect on vegetation. Plants which were on the move were checked, and those early-blooming rhododendrons which were opening their buds in January were severely injured, while all soft shoots on evergreens were blackened. The first open blooms on *Daphne Mezereum* were observed on the 6th, and the first crocus on the 20th, while the snowdrops were in full bloom all month.

March.—During the first week the weather was fine and dry. A change set in on the 6th, when a sharp gale, with rain, occurred in the morning. Rain also fell on the 7th, while the 8th was wild and stormy, with heavy showers of hail and rain. These conditions prevailed until the forenoon of the 9th. On the 11th, which was also stormy, there was a fall of snow. Thereafter for several days the weather kept dry and frosty, snow again falling on the 14th, while on the 15th and 16th a considerable quantity of rain fell. The latter half of the month was generally bright, dry, and sunny, though, on account of the easterly winds, at times very cold. The closing days were much milder.

The barometric readings show that the atmospheric pressure was erratic and irregular during the first half of the month. On the 1st the pressure was 29·30 inches, and on the 3rd, 30·10 inches. A fairly steady decline to 29·30 inches on the 9th, then, with a rise of four points on the 10th, was followed by the sharpest fall of the month, when, during the storm of the 11th, the reading was 28·90 inches. The subsequent rise was equally

sharp to 29·70 inches on the 14th, then another sudden fall to 29·10 inches on the 15th presaged the storm of rain which fell on the 15th and 16th. Thereafter the rise was steady, and the pressure kept fairly high, when on no less than nine days it was at 30·00 inches, and on the 31st at 30·10 inches.

While there were 21 dry days in the month, the rainfall amounted to 3·37 inches—more than the half of which fell in two days. The amount was about the average for this month. In March, 1905, the rainfall was 3·16 inches.

Frost to the extent of 60° was registered on 10 days, consequently the average temperatures — maximum, 45°, and minimum, 33°—are lower by 4° in each case than those of the same month in 1905, when only 1° of frost was registered, and curiously correspond very closely to the conditions of March, 1904, when, with 61° of frost on 15 days, the figures were 44° and 32° respectively.

Despite the cold, vegetation generally showed signs of activity, and the buds on hawthorns, willows, and balsam poplars swelled fast, and several were bursting into leaf in the last week of the month. The spring flowers also developed rapidly. The snowdrops were past their best in the first week. The "glory of the snow" *(Chionodoxa lucillæ)* was in full bloom on the 15th. The common narcissus *(Narcissus pseudo-narcissus)* began to open on the 18th, while the crocuses, which had been blooming intermittently for some time, were, along with the earlier daffodils, squills, hepaticas, &c., in their glory during the latter weeks of the month. Amongst shrubs, the *Forsythia suspensa* was in full bloom, and *Ribes sanguinea* showing flower.

The farmers availed themselves of the dry weather, and much seed was sown under favourable conditions.

April.—This, "the month of showers," belied its reputation, as it proved to be the driest month of the year. The first half was notably dry, as no rain fell, and, though there were occasional touches of frost in the mornings, the days were generally bright and sunny, and several were pleasantly warm. On the afternoon of the 15th there was a peculiar dust storm, which lasted several hours. Whether this was the precursor of a change in the weather or not, there was a disagreeable change for holiday-makers, as the weather of the 16th, on which the

Glasgow Spring Holiday was held, was of a most unpleasant nature, the day being dull, cold, and rainy. On the morning of the 19th, after a sharp frost, there was a dense fog, which lasted for several hours. Colder weather prevailed during the latter half of the month, many days being dull and raw, with occasional showers of hail, while on the 28th there were heavy showers of snow.

In the early part of the month the atmospheric pressure was high and fairly steady, and between the 1st and 15th it was only four times slightly below 30·00 inches. There were two sharp falls on the 5th to 29·60 and on the 13th to 29·80, on which days the weather was dull and cloudy. The highest reading of the barometer was 30·50 inches, on the 9th. After the 15th the pressure never touched 30·00 inches, while the lowest reading was 29·00 inches, on the 29th.

In regard to the temperature, the average maximum was 54° and the average minimum 35°. Though only a total of 12° of frost was registered on six days, the minimum thermometer was frequently low, and it was at or below freezing point (32° Fah.) on ten occasions, and at or below 35° on nineteen mornings, consequently the average minimum temperature is low, and 1° lower, while the maximum is 3° higher, than the respective figures for April, 1905.

There were 19 dry days, and the rainfall only amounted to 1·21 inches, which is, as already indicated, much below the average. In the corresponding month of 1905 the amount was 1·79 inches, with 15 dry days, whereas in April, 1904, there were 4·64 inches and only 6 dry days.

The sunny weather in the earlier part of the month had its natural effect on vegetation, and those species of trees which tend to start early into growth began bursting their buds, and by the 15th there was a decided sheen of green in the woodlands. Amongst the many deciduous trees which bloomed well, the Norway maple *(Acer platanoides)* was more strikingly effective when in flower than usual. Those early and usually effective hybrid rhododendrons, *Rhododendron Jacksoni* and *R. Eugenie*, were also in full flower by the above date. However, these, along with the acers, beeches, and chestnuts, were badly browned by the sharp frost on the 19th. The colder weather of the latter part of the month greatly checked the development of

vegetation, though the Incomparabilis and late-flowering section of narcissi bloomed as well as the earlier ones had done, and made an effective display on lawns and borders along with erythroniums, scillas, and other spring flowers. During the dry weather much was done throughout the district in the seeding of arable land and planting of potatoes.

May.—The cold, changeable weather which prevailed during the latter half of April continued almost throughout this month; very few days passed without rain falling. While there were a few mild days, on the other hand several were distinctly cold and stormy, notably the 17th, 24th, and 25th. During the afternoon of the 25th a sharp thunderstorm occurred, which was accompanied by heavy rain and a most remarkable shower of hail—in fact, more resembling broken ice than ordinary hail.

Curiously, considering the changeable nature of the weather, the barometric readings do not show a wide range in the atmospheric pressure. The lowest reading was 29·30 inches on the 3rd, and, though somewhat irregular in course, the highest point indicated was 29·90 inches, on the 13th and 14th. The only notably sharp decline was from the aforesaid point to 29·35 inches on the 17th, when, with a change in the wind from N.E. to N.W., that day was cold, wet, and stormy. The pressure after that date was fairly steady, ranging between 28·80 and 29·50 inches.

Though only a total of 4° of frost on two days was recorded, the radiating thermometer on the grass was frequently at freezing point, and the general temperature continued low throughout, consequently the average maximum, 54°, and minimum, 42°, are lower than usual for May. In May, 1905, the averages were 58° and 44° respectively, while the thermometer never fell to freezing point.

The rainfall amounted to 3·84 inches. No such amount has been registered for May for many years. There were only 7 dry days. In the previous May the rainfall was only 1·67 inches, and there were 17 dry days.

The unseasonable weather had a deterrent effect on vegetation. Grass grew but slowly, and, while there was every promise of an excellent display of bloom on most shrubs and trees, the

development of flower and growth of the earlier-growing species was sadly checked by the cold wind and low temperature. The hailstorm on the 25th had a disastrous effect on many trees and shrubs. In many cases the young shoots were blackened and broken, while such subjects as acers and chestnuts had their leaves torn and lacerated and ruined for the season. The fine promise of a crop of fruit on apples, pears, plums, &c., was dispelled by the same storm, as the trees were literally stripped of their flowers and embryo fruit within an hour. The leafing of the oak occurred on the 13th, and the ash on the 28th; in the former on the same date, and the latter a week later than in the previous year.

June.—After the 1st, which was showery, there was a marked improvement in the weather, which became dry and warm. These delightful conditions prevailed for some time, and no rain fell until the evening of the 14th, when there was a light drizzle. Heavier rain fell on the 17th, and, though more or less rain fell on most days thereafter, the weather, on the whole, was pleasant and enjoyable—indeed, several days were very warm and bright, notably the 18th and 19th.

When the fine weather prevailed there was a fairly high and steady line of atmospheric pressure. On the 1st the barometer indicated 29·30 inches, then, after a sharp rise to 30·00 inches on the 3rd, it kept above that point until the 14th, and on several occasions was as high as 30·20 inches. A slight depression occurred on the 15th, but the pressure kept about 30·00 inches until the 22nd, when it fell almost steadily to 29·50 inches on the 27th, on which day there was a strong S.W. wind; then, after a rapid rise, it kept at 29·90 inches during the two last days of the month.

The rainfall of June has for several years been low, and no exception occurred on this occasion, as only 1·69 inches were registered. There were 17 dry days. In the previous June the rainfall was only 0·82 inch, and there were 22 dry days.

In regard to the temperature, although the thermometer in shade was only above 70° on four occasions—9th, 10th, 11th, and 12th—it was above 60° on 26 days, the result being that the average maximum (65°) is 1° higher than in June of 1905,

when the temperature was above 70° on 7 days, while the average minimum (50°) is the same as what occurred in the corresponding month of the two preceding years. The hottest day of the month was the 11th, when the thermometer indicated 76° in the shade.

With the improvement in the atmospheric conditions, vegetation made rapid progress, and, considering the backward state in which things were, the subsequent results were better than anticipated. Those trees and shrubs which, through being later in growth, escaped the blighting storm in May, made excellent progress, and by the 8th hawthorns, laburnums, lilacs, &c., were in splendid bloom, while rhododendrons made as fine a display as has been seen in the city parks for many years. Field crops likewise made satisfactory progress, and the hay crop, which for a time looked doubtful, improved immensely.

July.—The fine weather which prevailed in June continued until the 12th. The morning of the 6th was wet, but afterwards the day was bright and warm. A change set in on the 13th, and the proverbial ill luck in regard to weather was experienced when the annual Glasgow Fair Holidays were observed. During these holidays, Fair Saturday is the most important day for the great mass of the people, hence the break in the weather was most unfortunate, and caused much discomfort to the many thousands who left the city for the coast and country on pleasure bent. The weather continued changeable and showery, with frequent strong winds, till the end of the month. From 3 till 5 on the afternoon of the 27th a peculiar darkness overspread the city.

The barometer readings show a moderate range of pressure, without any very notable variation. For the first two days it was at 29·90 inches, thereafter slightly rising for two days, after which falling to 29·70 on the 6th, when the morning was rainy. Rising steadily for several days, it was at 30·10 inches on the 11th and 12th. The change on the 13th was indicated by a drop to 29·80 inches, with a further decline to 29·40 inches on the 19th, which was the lowest reading for the month. After the 19th there was a slight rise in the pressure, which kept fairly steady, near to 29·70 inches, until the end of the month.

There were only 9 dry days, and, though the weather was showery, the amount of rain registered was only 2·37 inches, which is less than what fell in July, 1905, when, with 12 dry days, the amount was 2·81 inches. While there were fewer dry days and a less amount of rainfall than what was experienced in the previous July, the temperature was also lower throughout. In July, 1905, the maximum thermometer in shade was above 70° on 11 days, and even as high as 78° on two occasions, while in the month under notice the thermometer was only twice above 70°—viz., 72° on the 5th and 71° on the 26th—and on 9 days it did not exceed 60°. Consequently the average temperatures—maximum, 64°, and minimum, 50°—are in each case 3° lower.

While unpleasant for holiday-makers, the weather was, on the whole, conducive to the healthy growth of vegetation, though the showery conditions, with lower temperature, did not tend towards early maturity. The harvesting of the hay crop began during the first ten days, but thereafter operations were much hindered by the frequency of rain showers.

August.—During the greater part of the month there was a continuance of the weather conditions which characterised July. With the exception of four occasions, rain was registered every day up to the 26th, and on several occasions thunderstorms were experienced. The last five days were fine, bright, and warm.

The changeable nature of the weather is well shown by the irregular line of barometric readings. From 29·80 inches on the 1st, the pressure sharply fell to 29·30 on the 3rd. With an equally sharp rise it was at 30·00 inches on the 6th. A steady fall continued till the 13th, when for three days, during which heavy rains fell, the pressure was at 29·30 inches. Then, with a gradual rise, it reached 29·90 inches on the 19th. Afterwards, with sharp changes, it touched 29·40 inches on the 25th, thereafter quickly rising to 30·15 inches on the 28th, which was the highest point reached during the month, after which the tendency was downwards.

Owing to the frequency of heavy rains, the rainfall registered was 5·28 inches — an amount considerably above the average. There were only 8 dry days. In August, 1905, the rainfall amounted to 3·61 inches, with 12 dry days.

Notwithstanding the amount of rainfall, many days were warm, and on no less than 5 days the thermometer was above 70°. The highest reading was 76° on the 29th, and only twice did it fall below 60°. Consequently the average maximum, 64°, and minimum, 53°, are high compared with the previous August, when the respective figures were 62° and 50°.

The warm temperature made a marked difference in the appearance of root and grain crops, as the heat counteracted any tendency to sourness in the soil by excess of moisture, and all field crops improved greatly during the month. After the thunderstorm on the night of the 2nd, defoliation began on elms, limes, and sycamores in the city parks.

September. — The weather of this month was remarkable in several respects. The rainfall, with the exception of that of April, was the lowest of the year. Whilst the highest temperatures were recorded and no frosts occurred, the general conditions were of a delightful character. The hot weather which prevailed during the last week of August was intensified in the first week of this month. A change set in on the 3rd, and heavy rain fell on the evening of the 4th and morning of the 5th. Though the weather became cooler after that date, there were some splendid days, with beautiful sunsets. Monday, the 24th, which was the Glasgow Autumn Holiday, though one of the coolest days of the month, was fine and pleasant.

The barometer was fairly high and regular, and only two noteworthy fluctuations of pressure occurred. These were from 30·00 inches on the 4th to 29·60 inches on the 6th, and from 30·00 inches on the 9th, 10th, and 11th there was a sharp fall to 29·18 inches on the 15th. The rise thereafter was equally sharp, and the pressure was above 30·00 inches during the remainder of the month. On the 24th and 25th it was up to 30·40 inches.

As already stated, the rainfall was low, only 1·41 inches being registered. There were 21 dry days. In the corresponding month of 1905 the rainfall amounted to 2·11 inches, and there were 12 dry days.

In regard to the temperature, though the radiating thermometer on the grass was below freezing point on several occasions, no frost was registered by the thermometer in shade.

The maximum thermometer in shade was above 60° on 19 days, the three hottest days being the 1st, with 76°; the 2nd, with 80°; and the 3rd, with 82°. The average temperatures are, therefore, high, the maximum being 62° and the minimum 47°, compared with 58° and 46° respectively for September, 1905. The above average temperatures are the highest recorded for September since 1899, when these were 63° and 48°.

With the fine weather cereals ripened rapidly, and much harvesting was accomplished during the latter half of the month. The defoliation of deciduous trees in and around the city became very pronounced, and by the end of the month many were quite divested of leaves.

October.—There was a decided change in the character of the weather from that which was experienced in the preceding month. While September was dry and fine, October was wet and sunless. The first week was very mild, but dull, and rain fell on the 1st and 4th. The weather gradually got cooler, and frost set in on the evening of the 13th, and on the morning of the 14th 6° of frost were registered. This was the first frost of the autumn, which destroyed all tender plants and practically finished the display of flowers for the season. Though there were occasional fine days, very few were without rain during the twenty-four hours. These rains, at times mixed with hail, were frequently heavy and cold, and, as the winds were often strong, the weather conditions were not too pleasant.

The erratic line of atmospheric pressure was within a very moderate range during the first three weeks, the pressure see-sawing between 29·80 inches on the 1st to 29·20 inches on the 16th, as the extremes till the 24th, when there was a sharp rise to 30·10 inches on the 25th, which was followed by as sharp a fall, which reached its limit on the 29th, when the barometer indicated 29·00 inches.

With only 5 dry days, the rainfall for the month was above the average, the amount registered being 5·33 inches—a quantity very considerably in excess of what was recorded in the preceding October, when, with 18 dry days, the rainfall was only 2·57 inches.

Owing, no doubt, to the prevalence of westerly winds and the heavy rainfall, very little frost was registered during the

month. Only on two occasions did frost occur, and the total amount was but 8°. Therefore the average temperatures are high, the maximum being 55° and the minimum 43°, compared with 50° and 36° respectively for the same month of 1905, when, however, there was a total of 57° of frost.

Until the advent of the sharp frost already noted, there was an excellent display on autumn blooming plants. The winds and rains thereafter, not only completed the wreck of bloom and defoliation of all deciduous trees, excepting those which have persistent foliage like the oak, but sadly hampered the harvesting of late or belated crops.

November.—During the first week the weather was changeable, and frequently very disagreeable, with heavy rain at times. On the 6th, when there was a slight touch of frost, a thick fog enveloped the city all day, and, as it became very dense in the evening, much discomfort to pedestrians and inconvenience and delay to traffic were caused. From the 7th to the forenoon of the 14th the weather was dry and pleasant—that of the 13th being splendid. Rain set in on the 14th, and, with the exception of three days, occurred every day thereafter during the month, The latter days of which were very stormy.

The barometric readings show a wide and varied range in the atmospheric pressure. On the 1st the barometer indicated 29·40 inches. On the following day it was at 29·00 inches. A steady rise followed, till on the 10th it was up to 30·20 inches, keeping about that point until the 13th, after which date the pressure declined rapidly to 28·80 inches on the 18th, and remained about that point for three days. The rise thereafter was rapid, and on the 25th the barometer stood at 30·15 inches, from which point there was another sharp decline during the latter days of the month.

While not so heavy as that of October, the rainfall was above the average, as 4·17 inches were registered. There were 12 dry days. In the corresponding month of 1905 there was, with 10 dry days, a rainfall of 3·29 inches.

In regard to the temperature, though the thermometer was at freezing point (32° Fah.) on four occasions, no frost was registered. The averages are, therefore, higher than usual, the maximum being 49° and the minimum 41°. These averages

are the highest for this month since 1899, when they were 51° and 42° respectively — an abnormally high condition for November. The respective averages for the month in 1905 were 44° and 35°.

Owing to the excessive rainfall and the consequent sodden condition of the soil, the working of land and raising of root crops were much hindered. Pasture lands retained a freshness which is not frequently seen in November.

December.—Throughout this month the weather was variable. The early part of the 1st was fine, but rain began late in the day, and for five days the weather was more or less stormy and wet, though much of the rain fell in the evenings. After the 6th it became much colder, with frost in the mornings, some days being dull, raw, and cold. Another thick fog was experienced in the afternoon and evening of the 11th, while the 12th was wild and stormy in the morning, and it was a dirty day, though it became calm and clear at night. An inch of snow fell on the 13th, after which, for a few days, the weather was frosty. With a rising barometer, there was a period of wonderfully mild weather till the 24th, when a change occurred, and more wild, stormy, wintry weather was experienced, with snow on the 25th, 26th, 27th, and 30th. A thaw set in on the evening of the 31st.

Between the 1st and 12th the barometric readings show an erratic range in the atmospheric pressure. From 29·80 inches it fell, with only one check, to 29·10 inches on the 5th. A very sharp rise followed, as on the 7th it was up to 30·10 inches. A sudden drop to 29·50 inches on the 8th followed, and, after the recovery of three points on the 10th, another sharp fall occurred, and the lowest reading of the month was 28·90 inches, on the 12th. A steady rise followed until the 21st, when the pressure indicated was 30·40 inches. A sharp but steady fall followed to 29·10 inches on the 27th, when the wild, stormy weather was experienced. For two days thereafter a rise of five points occurred, but the pressure was declining as the year closed.

The rainfall amounted to 3·51 inches, of which a proportion was melted snow. There were 15 dry days. In December, 1905, the amount of rainfall was practically the same, it being 3·50 inches, while there were only 10 dry days.

In regard to the temperature, the thermometer was at or below freezing point on 16 days, and on the 26th and 30th did not rise above 30° Fah. The total amount of frost registered was 102°, the lowest reading being 16° on the 26th. Consequent on these conditions, the average temperatures are low, the maximum being 42° and the minimum 33°, compared with 45° and 39° respectively for December, 1905.

Owing to long prevalence of fresh, open weather, vegetation was clean and bright, while in sheltered places honeysuckle and other precocious plants were starting into growth and *Jasminum nudiflorum* blooming. The sharp frosts of this month checked the precocity of growth, and in places severely blackened soft, sappy growths, and injured the more tender class of shrubs.

In comparing the records for 1906 with those of the previous year, several outstanding points may be noted. The rainfall, 39·75 inches, is 10 inches above the rainfall of 1905, which was an exceptionally dry year, and 2 inches above the average for the past twelve years. While October, with a rainfall of 5·33 inches, was the wettest month of the year, it was closely followed by August, with 5·28 inches. January, with 4·74 inches, and November, with 4·17 inches, must also be considered wet months. The driest months were April, with only 1·21 inches; September, with 1·41 inches; and June, with 1·69 inches. Those months which have less than 2 inches of rainfall must be considered as dry months in this district. There were 152 days during the year in which no rainfall was registered. In 1905 the rainfall was 29·62 inches, and there were 160 dry days. Only on one occasion during the year was the rainfall for the day over 1 inch, the greatest amount registered for the 24 hours ending at 9 a.m. on 17th March being 1·08 inches.

The following table of rainfall in the various city parks where gauges are placed is interesting as showing the variations in the different localities. Due allowance must always, of course, be made for the local conditions, as the exposure, altitude, and surroundings are different in each case:—

RAINFALL DURING 1906 IN THE PUBLIC PARKS.

	Queen's.	Maxwell.	Kelvin-grove.	Spring-burn.	Alex-andra.	Glasgow Green.	Bella-houston.	Toll-cross.	Ruchill.	Botanic Gardens.	George Square.
Height of Gauge above Sea-level.	145 ft.	69 ft.	48 ft.	361 ft.	141 ft.	34 ft.	160 ft.	85 ft.	220 ft.	110 ft.	40 ft.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
January, -	4·74	4·95	4·34	3·79	4·47	4·83	4·01	5·00	4·70	4·53	4·49
February, -	2·83	2·09	2·58	2·10	2·50	2·57	1·89	3·01	2·70	2·45	2·53
March, - -	3·37	2·29	3·41	3·15	3·57	3·70	3·16	3·49	3·41	3·27	3·63
April, - -	1·21	0·91	1·14	1·15	1·09	1·09	0·89	1·31	1·35	1·26	1·11
May, - -	3·84	4·15	4·17	3·46	4·63	4·24	4·22	4·51	4·47	3·47	4·34
June, - -	1·69	1·48	1·56	1·66	1·67	1·55	1·20	1·68	1·71	1·42	1·59
July, - -	2·37	1·75	2·31	1·95	2·43	2·11	2·18	2·31	2·25	1·96	2·35
August, - -	5·28	4·99	5·01	4·89	4·86	5·04	5·18	4·91	5·00	5·04	4·71
September, -	1·41	0·98	1·98	1·74	2·03	2·21	1·49	1·84	2·10	1·75	1·69
October, -	5·33	5·12	4·84	4·23	5·15	5·18	4·75	5·61	5·07	5·03	4·86
November, -	4·17	4·32	4·07	4·56	4·49	4·43	3·92	4·31	4·70	3·89	4·21
December, -	3·51	2·67	3·79	3·64	3·67	3·64	3·02	3·51	4·11	3·50	3·58
Totals, -	39·75	35·70	39·20	36·32	40·56	40·59	35·91	41·49	41·57	37·57	39·09

With regard to the temperature, it has to be noted that the monthly averages are again high on the whole, and the mean temperature for the year is similar to that of the previous year. There was again an absence of very severe frosts. The thermometer in shade was at or below freezing point (32°) on 73 days, though actual frost was only registered on 57 days to the extent of 287°, as compared with 226° on 55 days in 1905. The lowest readings for the year were on the 14th March, when 18° of frost were registered, and on the 16th December, when 16° were noted. Perhaps the most notable feature regarding temperature was the absence of frost during November, while the month of October with only 8°, and January with 9°, are somewhat abnormal conditions. The warmest months were June, July, and August. The average maximum and minimum temperatures were respectively 65° and 50°, 64° and 50°, and 64° and 53°; while September, with 62° and 47°, followed closely. The hottest days of the year were, however, in September, when on the 2nd the reading was 80°, and on the 3rd, 82°, in the shade, the thermometer being 4 feet above the ground. It must be remembered, however, that these figures always apply to the preceding 24 hours at 9 a.m., when the daily readings are noted. The maximum thermometer in the shade was only at or above 70° on 4 days in June, 2 days in July, 7 days in August, and 3 days in September.

In regard to the barometric readings, the range was exactly 2 inches—the highest, 30·50 inches, on the 9th April, and the lowest, 28·50 inches, on the 10th February—whereas in 1905 the range was 2·40 inches.

In regard to the winds, though none were specially destructive, there were many gales of some severity. As usual, there was a preponderance of westerly winds. Excluding the direct north and south points, the winds from the western direction prevailed on 278 days, and from the eastern on 80 days. In the previous year the figures were 284 and 81 respectively.

The following table regarding temperature may be of interest for comparison:—

1906.	Queen's Park.	Maxwell Park.	Kelvingrove Park.	Springburn Park.	Alexandra Park.
Thermometer (in shade, 4 feet above ground level).					
Highest reading of year, ...	82° on 3rd Sept.	88° on 2nd Sept.	89° on 2nd Sept.	85° on 2nd Sept.	85° on 2nd Sept.
Lowest do.	14° on 14th Mar.	15° on 26th Dec.	14° on 14th Mar.	13° on 14th Mar.	16° on 14th Mar.
Number of days on which thermometer fell to freezing point (32°), ...	73 days	74 days	113 days	86 days	81 days
Number of days on which thermometer did not rise above freezing point (32°), ...	2 days	4 days	7 days	3 days	6 days
Degrees of Frost registered—					
January, ...	9° on 4 days	13° on 4 days	25° on 7 days	24° on 8 days	45° on 13 days
February, ...	92 " 19 "	64 " 15 "	130 " 23 "	130 " 24 "	97 " 18 "
March, ...	60 " 10 "	41 " 9 "	99 " 20 "	69 " 15 "	54 " 14 "
April, ...	12 " 6 "	29 " 9 "	67 " 16 "	18 " 5 "	17 " 7 "
May, ...	4 " 2 "	6 " 3 "	17 " 4 "	7 " 3 "	2 " 2 "
June, ...	...	.	...	...	...
July, ...	...	...	...	...	...
August, ...	...	...	...	...	...
September, ...	...	...	...	...	...
October, ...	8° on 2 days	13° on 4 days	13° on 3 days	6° on 2 days	5° on 3 days
November, ...	...	12 " 4 "	23 " 8 "	1 " 1 day	4 " 4 "
December, ...	102 " 14 "	114 " 13 "	130 " 18 "	105 " 14 days	63 " 12 "
Total frost registered, ...	287° on 57 days	292° on 61 days	504° on 99 days	360° on 72 days	287° on 73 days

Glasgow Green.	Bellahouston Park.	Tollcross Park.	Ruchill Park.	Botanic Gardens.	George Square.
90° on 3rd Sept.	86° on 2nd Sept.	89° on 2nd Sept.	89° on 3rd Sept.	89° on 2nd Sept.	81° on 2nd Sept.
17° on 14th Mar.	14° on 14th Mar.	10° on 14th Mar.	13° on 14th Mar.	18° on 26th Dec.	19° on 14th Mar.
46 days	94 days	77 days	84 days	98 days	59 days
3 days	3 days	3 days	4 days	5 days	3 days
6° on 3 days	20° on 7 days	24° on 6 days	18° on 5 days	20° on 6 days	10° on 4 days
59 „ 14 „	131 „ 23 „	53 „ 13 „	87 „ 18 „	70 „ 19 „	55 „ 14 „
40 „ 6 „	81 „ 14 „	65 „ 13 „	91 „ 16 „	33 „ 11 „	43 „ 9 „
6 „ 3 „	22 „ 8 „	32 „ 10 „	23 „ 6 „	24 „ 11 „	16 „ 7 „
...	4 „ 2 „	7 „ 3 „	9 „ 3 „	6 „ 3 „	2 „ 2 „
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	1° on 1 day	...	...	...
2° on 2 days	10° on 3 days	7 „ 2 days	6 on 2 days	7 on 2 days	1° on 1 day
...	5 „ 4 „	6 „ 4 „	2 „ 1 day	4 „ 2 „	2 „ 2 days
48 „ 11 „	120 „ 17 „	88 „ 15 „	120 „ 15 days	96 „ 16 „	47 „ 11 „
161° on 39 days	393° on 78 days	283° on 67 days	356° on 66 days	207° on 70 days	176° on 50 days

In regard to the general effect on vegetation, the excellent condition of trees and shrubs, caused by the favourable weather of the previous season, gave great promise for a glorious display of bloom in 1906. Though in some measure these hopes were fulfilled, a considerable amount of disappointment was caused by the sudden atmospheric changes which so frequently occur in our climate.

The growth in vegetation, which showed signs of activity as early as January, was checked by the colder conditions of February and March. Once, however, the power of the sun began to be felt, vegetation made rapid headway in the early part of April, only to receive another check by a sharp frost on the 19th of that month, which greatly damaged the bloom on early forms of rhododendrons and other shrubs which happened to be in flower, while the tender foliage of those trees which naturally leaf early also suffered severely. Growth was somewhat slower for a time, and the development of shoot and flower was retarded by the dry and cold weather which prevailed during the latter half of April and part of May. There was an excellent display of flower on most of the larger forms of trees, and the hopes for an excellent crop of fruit were justified by the glorious bloom on pears, plums, apples, and cherries. These hopes were, however, rudely dispelled by the disastrous hailstorm on the 25th May, which not only stripped off the flowers and embryo fruit from trees, but greatly damaged the young growths and foliage of many of the larger growing trees and shrubs. Those species of trees and shrubs which in their natural course were later in starting into growth, and thus escaped the damaging storm, made a splendid display, and verified the prediction of an excellent bloom. The hawthorns, laburnums, and other deciduous shrubs were generally well bloomed, whilst the later rhododendrons gave one of those periodical displays of flower which cause them to be ranked as one of the most valuable shrubs for our gardens and woodlands.

The pasture lands, which were unusually fresh and bright in the early months, got somewhat browned in April; and, while the grass was late in starting into growth, it improved rapidly in June, and hay crops were much better than anticipated. Cereals generally also turned out well, though later in being

harvested. Root crops were in some places irregular, but, on the whole, up to their average in bulk.

Excepting those species which got damaged after starting into growth, most trees and shrubs made a satisfactory growth, and, while not quite so well set with flower-buds as in the two previous years, there appears to be ample to make a good display in the coming season.

Subjoined is the abstract of the meteorological record for the past three years, as kept at Queen's Park.

JAS. WHITTON,
Superintendent of Parks.

City Chambers,
Glasgow, *February*, 1907.

COPY OF METEOROLOGICAL RECORD KEPT AT QUEEN'S PARK, GLASGOW.

Rain Gauge 145 Feet above Sea Level.

MONTHS.	1904.				1905.				1906.				Averages for the Last 12 Years.					
	Rainfall.	Thermometer. Average.		Dry Days.	Rainfall.	Thermometer. Average.		Dry Days.	Rainfall.	Thermometer. Average.		Dry Days.	Years.	Rainfall.	Mean Temperature.	Dry Days.	Number of Days on which 1° or more of Frost was registered.	Degrees of Frost registered.
	Inches.	Max.	Min.		Inches.	Max.	Min.		Inches.	Max.	Min.			Inches.				
January,	3·93	43	35	11	1·78	43	35	15	4·74	43	37	8	1895	27·57	45	202	99	823
February,	2·28	41	32	14	2·51	45	34	11	2·83	42	30	10	1896	33 90	47	209	63	331
March, ...	1·43	44	32	19	3·16	49	37	6	3·37	45	33	21	1897	40·22	46	205	61	347
April, ...	4·64	52	40	6	1·79	51	36	15	1·21	54	35	19	1898	38·44	48	212	42	190
May, ...	3·36	56	43	14	1·67	58	44	17	3·84	54	42	7	1899	41·67	47	193	64	415
June, ...	1·54	62	48	17	0·82	64	50	22	1·69	65	50	17	1900	46·46	47	164	57	326
July, ...	3·80	64	51	14	2·81	67	53	12	2·37	64	50	9	1901	34·65	47	201	70	327
August,...	3·49	63	52	12	3·61	62	50	12	5·28	64	53	8	1902	30·82	45	185	53	392
September,	2·73	59	46	17	2·11	58	46	12	1·41	62	47	21	1903	55·52	45	138	48	286
October,	2·12	54	43	11	2·57	50	36	18	5·33	55	43	5	1904	34·87	46	163	58	246
November,	2·07	47	37	15	3·29	44	35	10	4·17	49	41	12	1905	29·62	47	160	55	226
December,	3·48	42	34	13	3·50	45	39	10	3·51	42	33	15	1906	39·75	47	152	57	287
	34·87			163	29·62			160	39·75			152	Averages.	37·79	46°	182	60	350°

With the Cryptogamic Society of Scotland at Inveraray.

By D. A. Boyd.

[Read 28th October, 1907.]

The thirty-second annual conference of the Cryptogamic Society of Scotland took place at Inveraray during the third week in September in very favourable weather. The company in attendance numbered nineteen, and consisted of nine ladies and ten gentlemen.

Along with several others, the writer travelled to Inveraray on Monday, 16th September, by the turbine steamer "King Edward." They reached the hotel early in the afternoon to find that they were the pioneers of the party, and, after lunch, had a short ramble up the side of the loch. The Ostrich-Fern (*Struthiopteris germanica*, Willd.), the most handsome European representative of the fern tribe, has been planted in the old cemetery near the shores of the loch, and is thriving luxuriantly. In general contour, the barren fronds bear considerable resemblance to well-developed fronds of the common male-fern (*Lastræa Filix-mas*), but the fertile fronds present so remarkable an appearance as at once to attract the attention of an observant passer-by. They are narrow, erect, rigid, of a peculiar purplish-brown colour, and are produced in a cluster in the centre of the plant. Some specimens of one of the hardier species of palm had also been planted in the old cemetery, but seemed to have all died out, although some other examples of the same or an allied species have been more successfully grown in the open air in a sheltered spot a few miles further up the loch side. Several interesting microfungi were observed in the course of the walk, among which were *Puccinia chrysosplenii*, Grev., on *Chrysosplenium oppositifolium*; *P. buxi*, D.C., on *Buxus sempervirens*; *Phragmidium rubi-idæi* (Pers.) Wint., on *Rubus Idæus*; *Melampsora tremulæ*, Tul., on *Populus tremula*; *Ramularia ajugæ*, Sacc., on *Ajuga reptans*; and *R. calcea*, Ces., on *Nepeta Glechoma*.

Next forenoon (Tuesday), the party proceeded up the Dalmally road, gathering fungi as they went. About three-quarters of a mile from the hotel, the woods began to prove very productive. Amongst the larger Hymenomycetes noted were conspicuous white groups of *Pleurotus porrigens* (Pers.) Fr.; fragrant clusters of *Lentinus cochleatus*, Pers., Fr.; and a fine specimen of *Tremellodon gelatinosum*, Pers., obtained by Miss Bisset, Edinburgh, besides several smaller examples of that species. Although not unfrequent in the neighbourhood of Moffat, Dumfries, and other parts of the Solway area, the last-named species had not previously been recorded for "Clyde." As it was found, however, at Killin last year by Mr. Carleton Rea, B.C.L., M.A., and has also been ascertained to occur in the neighbourhood of Perth, its range of distribution in Scotland appears to be fairly wide. Amongst the smaller agarics observed were *Collybia tuberosa* (Bull.) Fr., *Mycena pterigena*, Fr., and *Claudopus variabilis* (Pers.) W. Sm. Fading fronds of *Asplenium Trichomanes* were dotted with the black perithecia of *Sphærella polypodii*, Fckl., not previously recorded for the British Isles.

A striking feature in the woods around Inveraray was the abundance and luxuriance of *Armillaria mucida* (Schrad.) Fr., a beautiful agaric which grew on dead beech trees. Its specific name is derived from the viscid moisture with which the surface of the pileus or cap is abundantly supplied. Another white species, *Pleurotus porrigens* (Pers.) Fr., occurred commonly on dead stumps in the woods throughout the district. Full-grown specimens, when growing erect, bore considerable resemblance to the white-spathed *Calla* or Egyptian Arum-lily of our gardens and greenhouses.

An afternoon walk through the woods extending westward from the Dalmally road proved rather unproductive, and yielded little else than common species, among which the beautiful *Cortinarius sanguineus*, Fr., was perhaps the most notable.

Next morning (Wednesday) an early ramble enabled several microfungi to be added to the list, including *Protomyces pachydermus*, Thüm., on *Taraxacum officinale; Pseudopeziza trifolii* (Bern.) Fckl., on *Trifolium repens;* and *Ps. ranunculi* (Wallr.) Fckl., on *Ranunculus repens.* After breakfast some time was devoted to a walk through part of the Castle grounds and woods,

where the luxuriance of the mosses attracted some notice. The beautiful *Hypnum crista-castrensis*, Linn., occurred in considerable quantity, while *Hylocomium loreum* (Linn.) B. & S., and other common species, gave promise of abundant capsules later in the season. On some of the trees *Neckera pumila*, Hedw., was observed in fine condition. At 11.30 the party sailed up the loch from Inveraray Pier to Ardkinglas, having chartered for their use the little steamer "Fairy," which runs between Inveraray and St. Catherines. This sail occupied about half-an-hour, and proved one of the most enjoyable items in the day's programme. A fine new mansion has lately been erected at Ardkinglas by the proprietor, Sir Andrew Noble. It is placed amidst delightful surroundings, about three-quarters of a mile from the village of Cairndow and parish church of Kilmorich, and commands a magnificent view of loch and mountain. The neighbouring woods are extensive, stretching from Cairndow for several miles towards St. Catherines. There is a little pier directly opposite the mansion, and another a short distance down the loch. The party landed at the latter, and at once proceeded into the woods, which, at first sight, seemed to promise well, but scarcely fulfilled the expectations formed regarding them. Among the species observed were *Clitocybe metachroa*, Fr., *C. clavipes* (Pers.) Fr., *Mycena filopes* (Bull.) Fr., *Inocybe hystrix*, Fr., and *I. lanuginosa* (Bull.) Fr. A number of interesting microfungi were obtained in the neighbourhood of the loch, the most notable of which were *Entyloma Trailii*, Mass., on *Matricaria inodora; Synchytrium aureum*, Schröt., on *Plantago lanceolata; Uromyces limonii* (D.C.) Wint., as Uredo on *Armeria maritima;* and *Orbilia marina*, Phil., on decaying fronds of *Fucus vesiculosus*. In the woods at Ardkinglas the luxuriance of the mosses was very noticeable, especially *Hypnum crista-castrensis*, Linn., which occurred in unusual abundance.

The annual dinner and business meeting of the Society took place in the evening, after the return of the party to Inveraray.

On the forenoon of Thursday, 18th September, the Dubh Loch, at the foot of Glen Shira, was visited, and a considerable number of interesting species were obtained in the neighbouring woods. Among the microfungi observed was *Entyloma Henningsianum*, Syd., parasitic on *Samolus Valerandi*, and not previously recorded for the British Isles.

Besides the species already referred to, mention may be made of *Amanita pantherina* (D.C.) Fr., *Clitocybe odora* (Sow.) Fr., *Entoloma Batschianum*, Fr., *Inocybe Godeyi*, Gill., *I. calamistrata*, Fr., *Cortinarius (Telamonia) paleaceus*, Fr., and *Nœmatelia nucleata*, Fr., also observed in the neighbourhood of Inveraray.

Owing to the prevailing coldness of temperature during the period of the formation and development of the mycelium, the crop of fungi this season has in many places proved disappointingly small, and almost everywhere has been considerably below the average. So far as the scarcity of Hymenomycetes and other large forms is concerned, the district around Inveraray has afforded no exception to the general rule, but parasitic moulds and other minute forms of fungus life have been fairly well represented. In spite of somewhat adverse circumstances, the Cryptogamic Society's visit to the shores of Loch Fyne has proved by no means fruitless, and has resulted in the addition of two species to the British list, and about a dozen to the catalogue for the Clyde area.

List of *Pycnogonida* Collected in the Clyde Area.

By Richard Elmhirst, F.L.S.,
Superintendent of the Millport Marine Station.

[Read 25th February, 1908.]

In the *Fauna and Flora of the Clyde Area* (1901—Local Committee of the British Association) the following list of Pycnogonida, or Sea-spiders, is given :—

Pycnogonum littorale, Fabr.
Phoxichilidium sp.
Pallene brevirostris, Johnst.
Nymphon gracile, Fabr.

In the course of my work at Millport I have taken the following species*:—

Pycnogonum littorale, Ström.

Common everywhere on the shore, except on bare sand; occasionally taken in shallow water. The three-legged larval stage and immature young are taken on the shore in late summer. I have failed to find this species in Lochs Riddon and Striven. (A. M. N.)

Endeis (Phoxichilus) spinosus (Montagu).

Taken occasionally in the dredge and trawl on clean ground, usually among hydroids; also recorded by Mr. W. D. Henderson on *Laminaria* in 15 fs. off Heads of Ayr (see *Ann. Rep. of Millport Station*, 1904); Dr. W. T. Calman, on Fairlie Sands, Sept., 1906; and A. M. N.

Phoxichilidium femoratum (Rathke).

Common on the stony parts of the shore, also dredged in shallow water. Sometimes found in company with *Pycnogonum* in considerable numbers. A male bearing eggs, taken in March, is the first case of any abnormality I have found among Pycnogonida. There are only three pairs of ambulatory legs; the third segment of the trunk and caudal segment are absent; in their place grows a well-developed normal ambulatory leg directed straight backwards; this leg is connected with the second segment of the trunk by a process similar to the lateral processes which normally bear the ambulatory legs. The anus is situated dorsally near the posterior end of the third coxal joint of the odd leg. (A. M. N.)

* Since this paper was read, Canon A. M. Norman, F.R.S., has read a paper on "The Podostomata (= Pycnogonida) of the Temperate Atlantic and Arctic Oceans," which was published in the *Journal of the Linnean Society*, Vol. XXX., in September, 1908. In that paper he revises the nomenclature, and records nearly the same species from the Clyde. I have put in the revised names, leaving the older in brackets, and Canon Norman's initials (A.M.N.) to each species that he has recorded.

ANAPHIA (ANOPLODACTYLUS) PETIOLATA (Kröyer).

Dredged a few times in fairly deep water off the Cumbraes. (A. M. N.)

ANAPHIA (ANOPLODACTYLUS) PYGMÆA, Hodge.

Fairly common on the shore, occasionally in company with *Pycnogonum* and *Phoxichilidium*. Referring to this species, Prof. Carpenter writes:—"This form is also widespread on our coasts. It is doubtfully distinct from the preceding (*A. petiolatus* (Kröyer)), but I have not followed Sars and others in uniting the two, as adults can be readily distinguished which show the shortened form of trunk and neck characterizing the animal as described by Hodge." * This form is evidently the same as *Phoxichilidium longicolle*, Dohrn; Sars and A. M. N. include both under *A. petiolata* (Kröyer).

I am indebted to Mr. T. V. Hodgson for help in the identification of this species.

PALLENE BREVIROSTRIS, Johnston.

Occasionally on the shore, and down to about 10 fs. (A. M. N.).

PALLENE PRODUCTA, G. O. Sars.

A. M. N. Several specimens which I recorded as "*brevirostris?*" are no doubt this species.

NYMPHON RUBRUM, Hodge.

Taken once on the shore, and once in 15 fs. off Keppel Pier. (A. M. N.)

NYMPHON GRACILE, Leach (as described by Sars in the *Norwegian North Atlantic Expedition*, 1876-1878: *Pycnogonidea*, 1891).

Taken once on the shore, and occasionally in shallow water. A. M. N. records this form, *i.e.*, *Nymphon gracile*, Sars *l.c.* (exclusive of all synonyms), as *N. brevirostre*, Hodge.

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* *Fisheries, Ireland, Sci. Invest.*, 1904, IV. (1905), p. 6.

AMMOTHEA LÆVIS (Hodge).

Occurs frequently near the Station on the shore. Varies considerably in colour, from pale yellowish shade to dark brown; others have claws nearly as in *A. echinata* (Hodge). In August I got four immature specimens showing the chelæ well developed (they disappear later) and the beginning of the ovigerous legs as stumps.

AMMOTHEA ECHINATA (Hodge).*

A. M. N.

Further search, by the use of townets attached to trawl or dredge, should bring to light other species and increase our knowledge of the distribution of the above species in the Clyde. The method has proved very successful elsewhere.

Sclerotinia baccarum, Rehm, and its Allies.

By D. A. BOYD.

[Read 27th May, 1908.]

IN various parts of Scotland, bushes of Blaeberry (*Vaccinium Myrtillus*) have been observed to produce in some seasons a considerable proportion of abortive fruits. These usually become stunted in growth, somewhat dry in substance, and whitish in external appearance. So far as Britain is concerned, attention to these abortive berries seems first to have been directed more than twenty years ago by Professor James W. H. Trail, M.D., F.L.S., Aberdeen University, one of our Society's Corresponding Members, who recognised them to be due to the agency of *Sclerotinia baccarum*, Rehm, one of the Discomycetes. In his "Revision of Scotch Discomycetes,"† he states that this fungus grows from a sclerotium produced in berries of *V. Myrtillus*, which it fills up and converts into a white mass; and that these sclerotia have been found by him in autumn within

* I have recently taken this species in a few fathoms near Keppel Pier.

† *Scottish Naturalist* (New Series) iv. 136.

the Areas of "Tay" and "Dee," and are not rare up to 1,500 feet; but that he is not aware of the apothecia having been detected in Britain. In Massee's *British Fungus Flora*, iv. 499, published in 1895, reference is made to Professor Trail's discovery of berries containing sclerotia, and it is stated that mature ascophores have not yet been recorded for this country. Abortive fruits of *V. Myrtillus*, exactly similar to those described by Professor Trail and Mr. Massee, appear to be not uncommon in the West of Scotland, and I have frequently observed them in the more hilly portions of the Ayrshire parishes of West Kilbride, Largs, Dalry, and Kilbirnie, where the blaeberry abounds. As producing "sclerotium in berries of *Vaccinium Myrtillus*," this species is recorded for West Kilbride in the List of the Microfungi of the Clyde Area, prepared by me in connection with the visit of the British Association to Glasgow in 1901.*

In its early or conidial form, *S. baccarum* is said to attack the young living branches of *V. Myrtillus*, and to be found on the concave side of curved shoots, where it appears as a white bloom or mould consisting of simple or branched chains of hyaline subglobose conidia, which much resemble those of *Oidium* or *Monilia*, two genera of Hyphomycetes. The mycelium finally affects the young berries, and forms within them "sclerotia," or densely compacted masses of hyphæ. The abortive fruits may be readily recognised by their peculiar appearance and colour, already referred to. After these have dropped to the ground, and undergone a period of rest, the smooth brown stipitate ascophores are developed from the sclerotia. It is said that as a rule only four of the eight spores contained in each ascus become fully developed, and the other four remain much smaller in size. For description and measurements of the ascophores, asci, spores, &c., reference may be made to Massee's *British Fungus Flora*, already cited, and to his *Text-book of Plant Diseases caused by Cryptogamic Parasites* (1899), 381.

At the Society's Excursion to Campsie Glen, Stirlingshire, on 9th instant, I was so fortunate as to discover several fully-developed specimens of the ascophores of *S. baccarum*. They

* *Handbook on the Natural History of Glasgow and the West of Scotland* (1901), 67.

were attached to sclerotia in mummied berries of *V. Myrtillus*, and grew amongst a deposit of fallen leaves of that shrub, on a little rocky ledge beside one of the tributaries of the Glazert Water. Examples of the sclerotia and fungi were carefully preserved, and have been deposited in the British Herbarium at the Natural History Museum at South Kensington.

The life history of several species of *Sclerotinia* presents features of considerable interest. In the more highly-developed forms, a conidial or "white-mould" stage has been traced, which closely corresponds to *Botrytis*, *Oidium*, *Monilia*, or other allied genera of Mucedineæ among the Hyphomycetes. After a period of activity, the mycelium forms those densely compacted masses known as "sclerotia," which are characteristic of the genus under notice. These were formerly regarded, and have been described, as independent fungi, and several of them (especially *Sclerotium durum*, Pers.) are very common on dead herb-stems or amongst decaying vegetable matter. They are generally black or dark-brown externally, white internally, and of a hard or horny substance. In this resting condition, the mycelium is able to withstand severe frost and other atmospheric conditions which might otherwise prove destructive to it. After a period of quiescence, one or more ascophores are produced from the sclerotium. In some species, however the ascigerous condition, and in others the conidial state, are as yet the sole forms which have been recognised.

The following is a list of the species which have been recorded for Britain, and are described by Mr. Massee in his two works already mentioned. Those which have been ascertained to occur within the Clyde Area are denoted by an asterisk.

I. Conidial and ascigerous forms known.

**S. baccarum*, Rehm.—See preceding remarks.

S. bulborum, Rehm.—Conidia of the type of *Botrytis*. Ascophores spring from an irregular sclerotium on bulbs of *Hyacinthus*, *Scilla*, *Crocus*, and *Allium*.

S. Duriæana (Tul.) Quel.—Conidia = *Epidochium arabicus*, Desm.; *Sphacelia ambiens*, Sacc. Ascophores grow from a small black elongated sclerotium in culms of *Carex arenaria* and *C. stricta*.

II. Ascigerous form only known.

**S. tuberosa* (Hedw.) Fckl.—In woods. Ascophore springs from an externally black sclerotium attached to rhizome of *Anemone nemorosa.*

S. trifoliorum, Eriksson.—Ascophore springs from a small black sclerotium on dead leaves and roots of cultivated clover and other allied leguminous plants.

**S. sclerotiorum* (Lib.) Massee.—Ascophore springs from a black sclerotium formed in stems of potato, cabbage, beet, and other plants.

S. Candolleana (Lév.) Fckl.—Ascophore grows from a small black sclerotium on fallen leaves of chestnut and oak.

S. filipes (Phil.) Sacc.—Ascophore developed from a wrinkled, black, nearly globose sclerotium amongst vegetable fragments in a damp situation.

**S. Curreyana* (Berk.) Karst.—Ascophore grows from *Sclerotium roseum*, Kneiff, in dead culms of *Juncus communis.*

III. Conidial form only known.

S. fructigena, Rehm.—Conidia (*Monilia fructigena*, Pers.) are developed on the fruit and leaves of apples and pears; and thick, black, wrinkled sclerotia are produced in the fruit.

S. Douglassi, Massee.—Conidia (*Botrytis Douglassi*, Tubeuf) and minute black sclerotia are produced on living twigs and youngest internodes of seedling *Abies Douglasii* and *Sequoia gigantea.*

S. galanthina, Ludwig.—Conidia (*Botrytis galanthina*, Berk.) are developed on bulbs and leaves, and minute black sclerotia are produced in decaying leaves and outer bulb-scales, of *Galanthus nivalis.*

S. pæoniæ, Massee.—Conidia (*Botrytis pæoniæ*, Oud.) are developed on the stems, and minute black sclerotia are produced in the tissues, of living pæonies.

S. parasitica, Massee.—Conidia (*Botrytis parasitica*, Cavara) are developed on leaves, stems, and flowers, and sclerotia are produced in the parenchyma of the bulbs, of cultivated tulips.

The following have been found on species of *Vaccinium* on the continent. They have not yet been observed in Britain, but may possibly occur in Scotland. In each case, conidia of the type of *Oidium* are produced on the host-plant; while sclerotia are formed in the berries, and the ascophores appear in spring.

S. urnula, Rehm.—Conidia developed on the surface of dark-brown blotches or spots on leaves and young stems of *Vaccinium Vitis-Idæa.*

S. oxycocci, Wor.—Conidia on the leaves and young branchlets of *V. Oxycoccos.*

S. megalospora, Wor.—Conidia on the nerve of the under-side of leaves of *V. uliginosum.*

Some Observations on the Dipterous Family Phoridæ.

By J. R. Malloch.

[Read 27th January, 1908.]

The *Phoridæ* have been much neglected by dipterists until quite recently, possibly owing to the small size and minute distinctions of the species. The recent monograph by Becker on the group gave an impetus to the study of these insects, and at present Dr. J. H. Wood, of Hereford, is engaged in working out the numerous British species. In the last published list of British Diptera 40 species are given, one of which, *Phora florea*, F., is a synonym of *P. abdominalis*, Fln., and several others are included as doubtful. At present I have 52 species taken in this locality (Bonhill). These include three species, viz., *P. cubitalis*, Beck., *P. costalis*, von Ros, and *P. sordida*, Ztt., which I recorded for the first time as British in the *Entomologist's Monthly Magazine*, and a large number of species that are still undescribed. One species, *P. pubericornis*, I took here in October, 1907, and described in the *Entomologist's Monthly Magazine* for January, 1908.

To prevent the following notes being of an uninteresting and formal nature, I purpose to give them as nearly as possible in accordance with the time of the insect's appearance, and not with the order of its sequence in the list of species.

The insects are to be found during the whole year, and in almost all situations, but in this as in other genera, some species have their particular habits. Where any particular species is found, in general it occurs commonly. The food of the species is very varied, and though the great majority of the species are unknown in the larva stage, from those that are known it may be inferred that they mostly feed upon carrion, putrid matter, fungi, snails (*P. maculata*), &c., while one or two are met with in the nests of ants and bees.

Early in the year a search in rotten fir stumps, especially where the coleopteron *Rhagium bifasciatum* has burrowed, produces several small species, one of which, *P. inæqualis*, Wood, is very common. It is allied to but quite distinct from *P. minor*, Ztt. Several times I have found quite a large number in a small tree stump. Later in the spring they may be found almost everywhere, so that I believe they merely hibernate in the trees.

Phora spinicincta, Collin, may be beaten out of furze early in the year, along with *P. albicolella*, Wood. One of the best species that occur in April is *P. opaca*, Mg., which I have taken not uncommonly at Murroch Glen. I have always swept it off grass or furze. Along with it occurs the very similar *P. lugubris*, Mg. This species occurs till late in June, and is almost everywhere met with, but is most common in old pastures. May brings with it a large number of species, which may be met with in various situations. *Phora projecta*, Beck., occurs on the hillside; and at weasel-traps, on the carrion used as bait, may be found *P. curvinervis*, Beck., and *P. abdominalis*, Fln. The former of these two species is most abundant, and I am quite sure I must have seen several hundreds of it in these traps *P. abdominalis* is one of our most beautiful species, with its bright orange-red abdomen in the female, and is much scarcer. I have found both these species in an undeveloped or immature condition in the traps, which seems to point to the fact that they had fed as larvæ on the carrion of the previous year. The common *P. inæqualis*, Wood, is also frequent in the traps. One

of the scarcest of our species, *P. femoratus* Mg., is also an early one, but is generally a chance capture. Of the flower-frequenting species which appear in May, and for the most part continue till June or later, the following may be noted as common :— *Conicera atra*, Mg., *C. similis*, Hal., *Trineura aterrima*, F., *T. velutina*, Mg., *Phora concinna*, Mg., *P. æqualis*, Wood, *P. campestris*, Wood, *P. parva*, Wood, *P. decreta*, Wood, *P. fuscinervis*, Wood, and *P. unispinosa*, Ztt. *Phora nudipalpis*, Beck., is not uncommon also, and *Metopina galeata*, Hal., is to be met with, where it is possible to see such a tiny mite, in fair numbers. One of our rarest species in the second group is *Phora Mallochi*, Wood. So far I have only obtained five specimens, one having been taken in September and the others late in April and May. *P. glabrifrons*, Wood, is also a rare species which occurs about the same time.

During the summer, most of the species may be met with by sweeping ; and common amongst them will be found *P. rufipes*, Mg., *P. rufa*, Wood, *P. lutea*, Mg., *P. crassicornis*, Mg., *P. Beckeri*, Wood, *P. rata*, Wood, *P. fusca*, Wood, *P. humilis*, Wood, *P. pleuralis*, Wood, and several others still unnamed. *Trineura Shineri*, Beck., is to be found on the hills early in summer. *Phora urbana*, Mg., I have met with also in early summer, but rarely, while *P. fennica*, Beck., I have only seen twice.

As the summer advances, some of the earlier species begin to disappear, but their places are taken by others, including *Gymnophora arcuata*, Mg., which is common among ferns and undergrowth ; *Phora thoracica*, Mg., which I have taken abundantly at rest on trunks of beech trees in July ; *P. cubitalis*, Beck., which occurs on poplar in fair numbers here ; and *P. umbrimargo*, Beck., a fairly common species.

Early autumn produces *Phora citreiformis*, Beck., and *P. vitripennis*, Mg., both of which may be taken on umbelliferous plants, *P. carinifrons*, Ztt., is now also most abundant.

As the season advances, fungi produce the following ; *P. sordida*, Ztt., *P. flava*, Fln., *P. pubericornis*, Mlch., and a large number of smaller fry. *Phora pusilla*, Mg., is one of the smaller species which occur about this time, as is also *P. costalis*, von Ros ; while *P. brevicostalis*, Wood, may be met with occasionally during autumn, along with *P. conformis*, Wood. One of the last species

to occur is *P. sublugubris*, Wood, which is very scarce.

A large number of those late species hibernate and appear the next spring. The hibernation quarters are generally thick furze branches, clumps of grass or ferns, under bark, &c., or in old nests. I have seen numbers of *P. rufipes* under the packing on bee-hives during winter. Though the list of local species is now fairly large, I have a good many that I do not include in it, as they have not been worked out yet; but I know, from what I can ascertain from my material at hand, that we must have almost as many more species as there are included in this list.

The Diptera of Clyde (Third List).

By R. Henderson.

[Read 26th May, 1908.]

An * distinguishes the species not recorded in Mr. P. H. Grimshaw's list (*Fauna and Flora, &c., of Clyde, 1901*), and the species so distinguished in my former lists are marked ** where additional records are now given.

Classification and nomenclature.—Verrall: *List of British Diptera, 1901*, with a few exceptions.

Abbreviations.—These are as before, with the following additions:—

Frankfield = Frankfield Farm and Frankfield Loch;

Mt. Stuart = Mount Stuart Estate, Bute, and the adjoining shore;

Kilchattan Bay = The Black Park, Suidhe Hill and Wood, and the ground about the Reservoirs;

South Bute = Glen Callum Bay and St. Blane's, Dunagoil Bay, and the marshy tract lying to the south of the Kilchattan Golf Course.

Fam. Limnobidæ.

****Anisomera æqualis**, Lw.,- - About a score of specimens of both sexes taken Glen Massan, 16th June, 1906 (A. R., J. J. F. X. K., and R. H.).

Fam. Tabanidæ.

Hæmatopota crassicornis, Whlbg., June — July. Glen Finart; Northfield Moor, Alexandria.

**Therioplectes montanus*, Mg., - June. Glen Massan.

**T. luridus*, Fln., - - - July. South Bute.

**T. tropicus*, Mg.—
var. *bisignatus*, Jaen., - July. South Bute.

**T. solstitialis*, Mg., - - - June—July. South Bute; Whiting Bay (D. E. M'P.); Lock Eck; Puck's Glen, Kilmun; Taynuilt and Goatfell, Arran (E. E. Austen in *British Blood-Sucking Flies*, page 43).

Fam. Leptidæ.

***Spania nigra*, Mg.. - - One ♂, 10th July, 1907, South Bute.

Fam. Bombylidæ.

**Phthiria pulicaria*, Mik.,- - June. Gailes (J. J. F. X. K.).

Fam. Empidæ.

**Rhamphomyia filata*, Ztt., - June. Frankfield.

**R. costata*, Ztt., - - - June. Inch Tavannach; Hawkhead Est.

**R. fascipennis*, Ztt., - - July. Kilchattan Bay.

***R. tenuirostris*, Fln., - - July—Sept. Glen Massan; Helensburgh Moor; Stepps Wood; Gailes; West Kilbride; Row; Frankfield.

**R. culicina*, Fln., - - - August. Murroch Glen; Gorge of Avon; Clober Dam, Milngavie.

**R. gibba*, Fln., - - - August. Frankfield.

R. umbripennis, Mg., - - June — July. Inverkip; Erskine; Glen Massan; Blairmore.

Empis vernalis, Mg.,- - - June. Frankfield.
**E. albinervis*, Mg., - - - Sept, Craigallion Loch.
**E. hyalipennis*, Fln., - - August. Murroch Glen.
**Hilara quadrivittata*, Mg., - June. Hawkhead Est.
**H. Beckeri*, Strobl., - - - June—August. Mkld. Canal; Frankfield. A smaller and darker species than the preceding one; the median thoracic stripes are further apart, the acrostical bristles being in four rows.
**H. chorica*, Fln., - - - July — August. Blairmore; Glen Massan; South Bute; Mount Stuart; Frankfield.
**Trichina clavipes*, Mg., - - July—August. Mount Stuart; Com. at Frankfield.
***Heleodromia stagnalis*, Hal., - August. Cardross.
***Ardoptera irrorata*, Fln., - July. Mount Stuart.
**A. guttata*, Hal., - - - Sept. Murroch Glen.
**Lepidomyia melanocephala*, F., July. South Bute; Mount Stuart.
**Tachista arrogans*, L., - - August—September. Gorge of Avon; Stepps Wood.
**T. connexa*, Mg., - - - July. Mount Stuart.
T. annulimana, Mg.,- - - June—August. Glen Massan; Frankfield; Ardentinny; Blairmore.
**Chersodromia hirta*, Wlk., - June. Gailes.
**Tachydromia pectoralis*, Fln., - July. Mount Stuart.
**T. annulata*, Fln., - - - June—July. Erskine; Possil M.; Frankfield; Mt. Stuart.

Fam. DOLICHOPODIDÆ.

**Pœcilobothrus ducalis*, Lw., - July. Mount Stuart.
**Hercostomus atrovirens*, Lw., - July. South Bute.
***Hypophyllus obscurellus*, Fln., July. Mount Stuart.
Machœrium maritimæ, Hal., - August. Cardross.
Xiphandrium appendiculatum, Ztt., June. Erskine.
**X. brevicorne*, Curt., - - August. Cardross.

**Syntormon monilis*, Wlk., - July. South Bute.
Medeterus apicalis, Ztt., - - July. South Bute.
***Campsicnemus loripes*, Hal., - August. Frankfield.
***Aphrosylus celtiber*, Hal., - July. South Bute.
**A. ferox*, Hal., - - - July—Augt. Cardross ; South Bute.

Fam. Pipunculidæ.

***Chalarus spurius*, Fln., - - July. South Bute ; Mount Stuart.
***Pipunculus confusus*, Verr., - July. Mount Stuart.
***P. sylvaticus*, Mg., - - July. Mount Stuart.

Fam. Syrphidæ.

**Pipizella maculipennis*, Mg., - June. Glen Massan.
P. flavitarsis, Mg., - - - June. Glen Massan.
***Chrysogaster splendens*, Mg., - June—July. South Bute.
***Chilosia grossa*, Fln., - - One ♀, 14th April, 1906, Kilchattan Bay.
**Platychirus podagratus*, Ztt., - June. Lochend Loch.
**Didea alneti*, Fln., - One ♀, 15th June, 1907. Inch Connachan (A.R.).
***Syrphus guttatus*, Fln., - - July. Mount Stuart.
**Brachyopa bicolor*, Fln , - - June. Erskine.

Fam. Tachinidæ.

**Ceromasia spectabilis*, Mg., - July — August. Possil M. ; Mkld. Canal ;
**Anthracomyia melanoptera*, Fln., July — August. Cardross ; Com. Mount Stuart.
**Melanophora atra*, Mcq., - - July. South Bute.
**Somolia aenea*, Mg.—
rebaptizata, Rnd., - - June. Inch Connachan.

Fam. Muscidæ.

***Cyrtoneura pabulorum*, Fln., - March. Mount Stuart.

Fam. ANTHOMYIDÆ.

Polietes hirticrura, Mde., - - July. Benmore Est., Kilmun.
P. albolineata, Fln., - - - Gen. dist.
Hyetodesia lucorum, Fln., - - Gen. dist.
H. marmorata, Ztt., - - - July. Glen Massan.
**H. serva*, Mg.,- - - - May—June. Milngavie; Murroch Glen; Erskine.
**H. dispar*, Fln., - - - May. Milngavie.
H. obscurata, Mg., - - - Gen. dist.
H. variabilis, Fln., - - - July—Sept. Kilchattan Bay; Bishop Loch.
H. umbratica, Mg., - - - May — June. Loch Libo; Murroch Glen; Hawkhead Est.; Glen Massan.
H. semicinerea, W., - - - June—Aug. Blairmore; Holy Loch; Frankfield; South Bute; Stepps Wood; Glen Massan.
H. errans, Mg., - - - Gen. dist.
H. signata, Mg., - - - Sept. Arden, L. Lomond.
**H. erratica*, Fln., - - - July. South Bute.
H. basalis, Ztt., - - - Gen. dist.
**H. rufipalpis* Mcq., - - - July—Aug. Monkd. Cl.; Crookston; Possil M.
H. scutellaris, Fln., - - - June—Sept. Erskine; Helensburgh Moor; Gorge of Avon; Arden, L. Lomond.
**H. variegata*, Mg., - - - May—Sept. Erskine and South Bar; Stepps Wood.
**H. pallida*, F., - - - June—Aug. Strone; Rowardennan.
**Allœostylus simplex*, W., - - Aug.—Sept. Stepps Wood; West Ferry Wood, Langbank.
**A. flaveola*, Fln., - - - July—Sept. Mount Stuart; Gorge of Avon; West Ferry Wood, Langbank.
**Mydæa vespertina*, Fln., - - May. Gorge of Avon.

M. urbana, Mg., - - - July—Sept. Dumgoyne; Mill Pln., Cadder; Possil M.; Holy Loch; Blairmore.

**M. separata*, Mg., - - - June. Erskine.

**Spilogaster duplicata*, Mg., - May—Sept. Gen. dist.

S. communis, Dsv., - - - July—Aug. Troon; Crookston; Cambuslang; Loch Eck.

**S. quadrum*, F., - - - June — Aug. Ardentinny; Troon; Mount Stuart; Finnich Glen; Loch Eck; Gailes; Strone.

**S. tetrastigma*, Mg., - - July. Luss Glen.

**S. protuberans*, Ztt., - - June. Gailes; Troon.

**S. consimilis*, Fln., - - July. Blairmore.

Limnophora solitaria, Ztt., - May — July. Sandbank; Strone.

**Macrorchis meditata*, Fln., - June. Troon.

Hydrotœa ciliata, F., - - May—June. Gorge of Avon; Cadd. Wild.; Bardrane Glen, Johnstone; Erskine.

H. occulta, Mg., - - - June — Aug. Cambuslang; Gailes.

H. irritans, Fln., - - - Gen. dist.

H. dentipes, F., - - - Gen. dist.

**H. similis*, Mde., - - July—Aug. Troon; Mount Stuart.

**H. militaris*, Mg.—*impexa*, Lw., - - - Gen. dist.

H. albipuncta, Ztt.—*fasciculata*, Mde., - - July—Aug. Stepps Wood; South Bute.

Drymyia hamata, Fln., - - Com. and gen. dist.

Trichopticus cunctans, Mg., - July—Sept. Kilchattan Bay; Stepps Wood.

**T. semipellucidus*, Ztt., - - Augt. Gorge of Avon.

T. hirsutulus, Ztt., - - - July. Blairmore.

**T. pulcher*, Mde., - - - July — Aug. Glen Massan; Frankfield.

**Hydrophoria ambigua*, Fln., -	Aug. — Sept. Stepps Wood; Frankfield.
**H. caudata*, Ztt., - - -	June. Hawkhead Est.
H. conica, W., - - - -	Com. and gen. dist.
**H. anthomyiea*, Rnd., - -	July — Aug. Cambuslang; Holy Loch.
Hylemyia lasciva, Ztt., - -	June. Erskine; Murroch Glen.
**H. seticrura*, Ztt., - - -	July. Glen Massan.
H. nigrimana, Mg., - - -	Gen. dist.
**H. coarctata*, Fln., - - -	June—Aug. Troon; Cambuslang.
Anthomyia radicum, L., - -	Gen. dist.
**A. sulciventris*, Ztt., - - -	Gen. dist.
**Chortophila arenosa*, Ztt., -	Aug. Gailes.
**C. cinerella*, Fln., - - -	Aug. Gailes.
**C. trapezina*, Ztt., - - -	July. Frankfield.
**C. sepia*, Mg., - - - -	May. Possil M.
**C. Billbergi*, Ztt., - - -	May. Craigton Wd., Milngavie.
Phorbia floccosa, Mcq., - -	Gen. dist.
**P. transversalis*, Ztt., - -	April. Kilchattan Bay.
**P. muscaria*, Mg., - - -	Mar.—Apr. Mount Stuart.
**Pegomyia betæ*, Curt., - -	June. Cambuslang.
**P. setaria*, Mg., - - -	May—July. Frankfield; Mill Pln., Cadder.
**P. hæmorrhoum*, Ztt., - -	May. Cambuslang.
**P. latitarsis*, Ztt., - - -	July. Loch Eck.
P. bicolor, W. - - - -	Com. and gen. dist.
**P. nigritarsis*, Ztt., - - -	Gen. dist.
**P. ephippium*, Ztt., - - -	July. Mt. Stuart.
**P. flavipes*, Fln., - - -	July. Holy Loch.
**Chirosia albitarsis*, Ztt., - -	July. South Bute.
**Homalomyia hamata*, Mcq., -	June. Troon.
**H. fuscula*, Fln., - - -	July. Glen Massan.
**H. pallitibia*, Rnd., - - -	Sept. West Ferry Wood, Langbank.
**H. canicularis*, L., - - -	Com. and gen. dist.

H. aërea, Ztt., - - - - June—July. Glen Massan; Hawkhead Est.; Mt. Stuart; Frankfield.

**H. sociella*, Ztt., - - - June — July. South Bute; Glen Massan; Northfield Moor, Alexandria.

H. serena, Fln., - - - Com. and gen. dist.

**H. incisurata*, Ztt. - - - May — October. Frankfield; Hawkhead Est.

**H. genualis*, Stein., - - - Augt. Frankfield.

Azelia Macquartii, Stæg., - - Gen. dist.

A. Zetterstedtii, Rnd., - - Augt. Stepps Wood.

A. cilipes, Hal., - - - Gen. dist.

A. gibbera, Mg., - - - Augt. Frankfield.

**Cœlomyia mollissima*, Hal., - May — June. Cambuslang; Waulkmill Gl.; Gorge of Avon; Lochend Loch; Stepps Wd.

**Caricea tigrina*, F., - - - Gen. dist.

**C. exul*, Ztt.—
Spilogaster protuberans, Ztt., *q.v.*

**C. intermedia*, Fln., - - June—Augt. Gorge of Avon; Kilchattan Bay; Northfield; Moor, Alexandria.

**C. means*, Mg., - - - June — July. Holy Loch; Northfield Moor, Alexandria; Blairmore; Kilchattan Bay.

Cœnosia sexnotata, Mg., - - July—Augt. Mount Stuart; Frankfield; South Bute.

**C. geniculata*, Fln., - - - July. South Bute.

**Fucellia fucorum*, Fln., - - March—August. South Bute; Mount Stuart; Dunure; Cardross.

**F. maritima*, Hal., - - - June—August. South Bute; Gailes; Mount Stuart.

Fam. CORDYLURIDÆ.

**Cordylura pudica*, Mg., - - July—Sept. Dundonald Glen; Possil M.

Paralleloma albipes, Fln., - - June—Aug. Troon; Bowling; Bardrane Glen; Hawkhead Est.

**Amaurosoma fasciata*, Mg., - May — June. Cambuslang; Gorge of Avon.

A. tibiella, Ztt., - - - June. Glen Massan.

**A. brevifrons* Ztt., - - - May—June. Gorge of Avon; not uncom. at Cambuslang.

Norellia spinimana, Fln., - - June—Aug. Troon; Dundonald Glen; Erskine; Mount Stuart; Possil M. (J.E.M.).

**N. liturata*, Mg., - - - June. Erskine.

**N. flavicornis*, Mg.—*spinigera*, Ztt., - - June. Glen Massan; Castle-Milk, Rutherglen.

Spathiophora hydromyzina, Fln., Aug. Monkd. Cl.

Scatophaga maculipes, Ztt., - May — June. Cambuslang; Erskine; Possil M.

**S. ordinata*, Beck, - - - May — July. Glen Massan; Glen Finart; Cambuslang.

S. lutaria, F., - - - Com. and gen. dist.

S. squalida, Mg., - - Gen. dist.

S. litorea, Fln., - - - - March—Sept. South Bute; Dundonald Glen; Kilchattan Bay; Cardross; Dunure.

**S. villipes*, Ztt., - - - April. Dunure; Kilchattan Bay.

**Ceratinostoma ostiorum*, Hal., - April — July. Holy Loch; Ardmore Point; Blairmore; Kilchattan Bay; Bowling.

Clidogastra nigrita, Fln.. - - May—June. Sandbank; Inch Tavannach.

Gymnomera tarsea, Fln., - - June. Frankfield; Northfield Moor, Alexandria.

Fam. PHYCODROMIDÆ.

**Orygma luctuosum*, Mg., - March—April. Dunure; Kilchattan Bay.

**Cœlopa pilipes*, Hal., - - June—Augt. Cardross; Gailes; Troon.

**Fucomyia frigida*, Fln., - - April. Dunure.

Fam. Helomyzidæ.

**Helomyza rufa*, Fln., - - June — July. Mill Pln., Cadder; Mount Stuart.

**H. similis*, Mg., - - - Augt.—Sept. Finnich Glen; Gorge of Avon.

H. lævifrons, Lw., - - - July — Sept. Luss Glen; Woodend Loch; Glen Massan; Craigallion Loch; Blairmore; Frankfield.

**H. Zetterstedtii*, Lw., - - July—Sept. Glen Massan; Gorge of Avon; West Kilbride.

**H. flavifrons*, Ztt., - - - June. Inch Connachan.

**Allophyla atricornis*, Mg., - June—July. Inverkip; Mount Stuart.

**Œcothea fenestralis*, Fln., - June. Monkd. Cl.

**Eccoptomera longiseta*, Mg., - July. Mount Stuart.

**Blepharoptera inscripta*, Mg., - May—July. Glen Massan; Gorge of Avon; Monkd. Cl.

B. serrata, L., - - - - March—July. Murroch Glen; Dennistoun (indoors); Frankfield; Mount Stuart.

**B. modesta*, Mg., - - - April.

**Heteromyza commixta*, Coll., - July—Oct. Erskine; Blairmore.

**Tephrochlamys canescens*, Mg.—*rufiventris*, Mg., - - July—Sept. Gorge of Avon; South Bute.

**T. flavipes*, Ztt., - - - Oct. Garscube Est.

Fam. Sciomyzidæ.

**Actora æstuum*, Mg., - - Augt. Gailes.

**Œdoparea buccata*, Fln., - - July—Augt. Mount Stuart; South Bute; Cardross.

Dryomyza flaveola, F., - - Gen. dist.
D. decrepita, Ztt., - - - Gen. dist.
Neuroctena anilis, Fln., - - Gen. dist.
**Sciomyza cinerella*, Fln., - - July. Mt. Stuart.
**S. pallidiventris*, Fln., - - July. Mt. Stuart.
S. albocostata, Fln., - - - Augt. Gorge of Avon.
Phæomyia fuscipennis, Mg., - June—July. Glen Massan; South Bute; Blairmore.
Tetanocera elata, F., - - Gen. dist.
T. lævifrons, Lw., - - - Gen. dist.
T. sylvatica, Mg., - - - Gen. dist.
**T. unicolor*, Lw., - - - June—July. Murroch Glen; Frankfield; Possil M.; Kilchattan Bay.
T. ferruginea, Fln.—
robusta, Lw., - - - Gen. dist.
T. coryleti, Scop., - - - June—July. Possil M.; Holy Loch; Mill Pln., Cadder; Cambuslang; Glen Massan.
T. umbrarum, L., - - - July. Glen Massan.
**T. punctulata*, Scop., - - June—July. Troon.
Limnia unguicornis, Scop., - July. Mount Stuart.
**L. oblitera*, F., - - - July. Kilchattan Bay.
Elgiva albiseta, Scop., - - June — August. Frankfield; Glen Massan; Murroch Glen; Monkd. Cl.
E. dorsalis, F., - - - - June — August. Bowling; Frankfield; Possil M.: Langbank.
**E. lineata*, Fln., - - - July—Sept. Glen Massan; Bishop Loch; South Bute; Holy Loch.
**E. cucularia*, L., - - - April. Stepps Wood.

Fam. PSILIDÆ.

Psila fimetaria, L., - - - Gen. dist.
P. rufa, Mg., - - - - June. Hawkhead Est.
P. pallida, Fln., - - - July. Cambuslang.

P. rosæ, F., - - - - Augt. Dennistoun (indoors); Frankfield.

**P. nigricornis*, Mg., - - June—July. Bowling; Mount Stuart.

P. atra, Mg., - - - - June. Frankfield; Erskine; Possil M.; Northfield Moor, Alexandria.

Loxocera aristata, Pz., - - July. Kilchattan Bay; Monkd. Cl.; Glen Massan; Loch Eck.

**L. albiseta*, Schrk., - - - July. Holy Loch.

Fam. Micropezidæ.

Calobata petronella, L., - - June. Cambuslang; Glen Massan.

Fam. Ortalidæ.

**Tetanops myopina*, Fln., - - June. Gailes.

Rivellia syngenesiæ F., - - June—July. Luss Glen; Troon; Blairmore; Holy Loch.

Seoptera vibrans, L., - - - July. Strone.

Fam. Trypetidæ.

**Acidia cognata*, W., - - July. Mill Pln., Cadder; Possil M.

A. heraclei, L., - - - - Augt. Crookston.

**Spilographa Zoë*, Mg., - - June. Bowling.

**Trypeta lappæ*, Cedj., - - July. Mount Stuart.

**Tephritis tessellata*, Lw., - - July. Mount Stuart.

T. leontodontis, Deg., - - June. Murroch Glen.

Fam. Lonchæidæ.

**Lonchæa vaginalis*, Fln., - - June. South Bute.

**L. tarsata*, Fln., - - - June. Frankfield.

**L. ænea*, Mg., - - - - June. Northfield Moor, Alexandria.

**L. laticornis*, Mg., - - - July. Mount Stuart; Loch Eck.

**Palloptera saltuum*, L., - - June—July. Mount Stuart; Possil M.; Murroch Glen.
P. umbellatarum F., - - June—Augt. Troon; Giffnock; Crookston.
**P. trimacula*, Mg., - - - Gen. dist.

Fam. SAPROMYZIDÆ.

**Sapromyza decempunctata*, Fln., July. Luss Glen.
**S. pallidiventris*, Fln., - - June—Oct. Gen. dist.
S. obsoleta, Fln., - - - July — Augt. Possil M.; Cardross; Holy Loch.
S. rorida, Fln., - - - - Com. and gen. dist.
S. præusta, Fln., - - - Com. and gen. dist.
**S. anisodactyla*, Lw., - - Oct. Erskine.
**Lauxania ænea*, Fln., - - June—Sept. Hawkhead Est.; Northfield Moor, Alexandria; Dougalston (North) Wood, Milngavie.

Fam. OPOMYZIDÆ.

**Balioptera tripunctata*, Fln., - April—August. Cardross.
**B. combinata* L., - - - June—Sept. Bardowie Loch; Possil M.; Murroch Glen; Hawkhead Est.; Holy Loch.
Opomyza germinationis, L., - Com. and gen. dist.
**O. florum*, F., - - - - Augt.–Sept. Craigallion Loch; Monkd. Cl.

Fam. SEPSIDÆ.

Sepsis cynipsea, L., - - - Com. and gen. dist.
Nemopoda cylindrica, F., - - Gen. dist.
Themira putris, L., - - - July—Augt. Cardross; South Bute.
**T. pilosa*, Dsv., - - - June — August. Northfield Moor, Alexandria; Dundonald Glen.

Fam. GEOMYZIDÆ.

**Anthomyza gracilis*, Fln.,- - July. South Bute; Mount Stuart.

**Paranthomyza nitida*, Mg., - June. Erskine.
**Diastata unipunctata*, Ztt., - March—August. Dundonald Glen; Mount Stuart.
**D. inornata*, Lw., - - - Sept. West Ferry Wood, Langbank.

Fam. EPHYDRIDÆ.

**Notiphila uliginosa*, Hal., - July. Holy Loch.
**N. riparia*, Mg., - - - July. Kilchattan Bay; South Bute; Monkd. Cl.
N. cinerea, Fln., - - - June—Sept. Frankfield; Possil M.; Bishop Loch.
Hydrellia griseola, Fln., - - June. Hawkhead Est.; Possil M.
**H. chrysostoma*, Mg., - - Gen. dist.
**H. nigripes*, Ztt., - - - July. Glen Massan.
**Philhydria punctatonervosa*, Fln., July. Mount Stuart.
**Parhydra fossarum*, Hal., - Feb.—Sept. Bishop Loch; Cathkin Quarry; Dundonald Glen.
**P. quadripunctata*, Mg., - - Feb.—July. Cathkin Quarry; Mill Pln., Cadder; Murroch Glen; South Bute.
**Ilythea spilota*, Curt., - - Sept. Bishop Loch.
**Cœnia palustris*, Fln., - - May—Sept. Mill Pln., Cadder; Bishop Loch.
**Scatella quadrata*, Fln., - - Augt. Frankfield.
**S. sorbillans*, Hal., - - - Augt. Cardross.
**S. æstuans*, Hal., - - - March — July. South Bute; Mount Stuart.
**S. stagnalis*, Fln., - - - April—Septr. Murroch Glen; Bishop Loch; Cardross; Frankfield; Erskine.

Fam. DROSOPHILIDÆ.

**Scaptomyza flaveola*, Mg., - July. Mount Stuart.
**S. graminum*, Fln., - - April—Sept. Gen. dist.

**Drosophila transversa*, Fln., - June—July. Glen Massan; Northfield Moor, Alexandria; Mount Stuart.
**D. phalerata*, Mg., - - - Sept. Gorge of Avon.
**D. fenestrarum*, Fln., - - April—June. Murroch Glen.
**D. cameraria*, Hal., - - Sept. Dougalston (North) Wood, Milngavie.
**Aulacigaster rufitarsis*, Mcq., - June. Erskine.

Fam. CHLOROPIDÆ.

**Meromyza pratorum*, Mg., - June. Troon.
**M. nigriventris*, Mcq., - - July. Mount Stuart.
**Centor cereris*, Fln., - - July. Possil M.; Holy Loch; Glen Massan.
**C. myopinus*, Lw., - - - July. Possil M.
**C. nudipes*, Lw., - - - July—Augt. Holy Loch; Cardross; Blairmore; Kilchattan Bay.
**Diplotoxa messoria*, Fln., - July. Holy Loch.
**Chlorops puncticollis*, Ztt., - June—July. Hawkhead Est.; Mount Stuart.
**C. speciosa*, Mg., - - - June—Augt. Monkd. Cl.; Loch Eck; Possil M.; Glen Massan; Cardross.
**C. lateralis*, Hal.—*scutellaris*, Ztt., - - - July. Holy Loch; Loch Eck.
**C. minuta*, Lw., - - - June—Augt. Holy Loch; Glen Massan; Possil M.; Troon.
**Oscinis frit*, L., - - - Augt.—Sept. Cardross; Bishop Loch.
**Elachyptera cornuta*, Fln., - March. Cadd. Wild.

Fam. AGROMYZIDÆ.

**Agromyza reptans*, Fln., - - June—Sept. Erskine; Hawkhead Est.
A. nigripes, Mg., - - - May — June. Cambuslang; Gorge of Avon.

**A. flaveola*, Fln., - - - July—August. Monkd. Cl.; Blairmore; Mount Stuart.

**A. curvipalpis*, Ztt., - - June—July. Mount Stuart; Hawkhead Est.

**A. geniculata*, Fln.—*capitata*, Ztt., - - - July. Glen Massan; Possil M.

**Ceratomyza denticornis*, Pz., - July. Holy Loch.

**Ochthiphila polystigma*, Mg., - July. Mount Stuart.

**O. geniculata*, Hal., - - - July. Mount Stuart.

**O. flavipalpis*, Hal., - - July—Augt. Mount Stuart; Gailes.

**Schœnomyza litorella*, Fln.—*fasciata*, Mg., - - - June—Sept. Cardross; Mount Stuart; Bishop Loch; Inch Tavannach.

Fam. Phytomyzidæ.

**Phytomyza notata*, Mg., - - May—Sept. Gorge of Avon; Possil M.; Hawkhead.

**P. rufipes*, Mg., - - - August. Possil M.

**P. Zetterstedtii*, Schin., - - April — June. Possil M.; Murroch Glen; Erskine; Calderwood Glen, E. Kilbride; Bowling.

**Chromatomyia obscurella*, Fln., April — Octr. Frankfield; Gorge of Avon; Erskine; Monkd. Cl.; Cambuslang; Hawkhead Est.; South Bute; Mount Stuart.

**C. affinis*, Mg., - - - July — August. Blairmore; Murroch Glen.

**C. albiceps*, Mg., - - - June—July. Possil M.; Blairmore.

Fam. Borboridæ.

**Borborus nitidus*, Mg., - - May—Octr. Gen. dist.

**B. niger*, Mg., - - - May. Troon; Helensburgh Moor; Gorge of Avon.

**B. suillorum*, Hal., - - - Feb.—March. Stepps Wood; Cadd. Wild.
B. equinus, Fln., - - - Feby.—Novr. Gen dist.
**B. nigrifemoratus*, Mcq., - - July. Mount Stuart.
B. geniculatus, Mcq., - - June — Sept. Possil M.; Dougalston (North) Wood, Milngavie; Frankfield.
**Sphærocera subsultans*, F., - June. Erskine; Monkd. Cl.
**S. pusilla*, Fln., - - - Sept. Murroch Glen.
**Limosina fontinalis*, Fln., - Feb. — Aug. Stepps Wd.; Cadd. Wild.; Busby; Murroch Glen; Rutherglen (T.W.); Frankfield.
**L. lutosa*, Stnh., - - - Sept. Bishop Loch.
**L. limosa*, Fln., - - - Sept. Bishop Loch.
**L. pumilio*, Mg., - - - Feb. and Sept. Cathkin Quarry; Bishop Loch.
**L. sylvatica*, Mg., - - - Feby.—Sept. Hawkhead Est.; Monkd. Cl.; Cadder Wild.; Rutherglen (T.W.); Northfield Moor, Alexandria.
**L. crassimana*, Hal., - - Feby.—Aug. Bishop Loch; Frankfield; Cadd. Wild.

Fam. PHORIDÆ.

**Trineura aterrima*, F.—*stictica*, Mg., - - - June—August. Helensburgh Moor; Frankfield; Mount Stuart.
**T. velutina*, Mg., - - - June. Hawkhead Est.; Stepps Wood.
**T. Schineri*, Beck., - - - April—May. Stepps Wood; Frankfield.
**Phora rufipes*, Mg., - - - Feb.—March. Stepps Wood; Dennistoun (indoors).
**P. projecta*, Beck., - - - March—Oct. Stepps Wood; Erskine; Frankfield.

Fam. Hippoboscidæ.

**Melophagus ovinus*, L., - -	Feb. — March.	Carntyne; Riddrie.

Note.—Additional species occurring in "Clyde" will be found in Mr. J. R. Malloch's contributions ("Diptera in Dumbartonshire) to the *Ent. Mo. Mag.*, viz., vol. xvii. (second series), 1906, pp. 41, 233, 257, and 276; and vol. xviii., pp. 43 and 86.

Erratum.

Ante, vol. viii. (N.S.), part I.—

Page 19, line 1, for "*tarsalis*, Schum.," read "*discimanus*, Lw."

Autumn and Winter Bird-Life of the Fairlie Shore.

By Robert W. S. Wilson.

[Read 31st March, 1908.]

Unlike some other parts of Ayrshire, notably Lendalfoot and Beith, the Fairlie district has never been fortunate in possessing a resident historian of its avifauna, and consequently but little has been published on this subject.

The recently published "List of the Birds of Ayrshire" by the Glenfield Ramblers' Club, Kilmarnock, does not contain any information regarding this district, but remarks, when speaking of Mr. Charles Berry's observations at Lendalfoot, that "It is much to be regretted that a similar series of notes is not available from some locality near the other end of the Ayrshire seaboard, where the different nature of the shore is more attractive to certain types of birds."

The following notes refer principally to the period from 1901, and are the result of the many visits I have paid to this district

during that time. As these visits have always been in the months from August till February inclusive, I have been unable to deal with the bird-life of the spring and summer months. In preparing these notes, I have confined myself to those species of birds which have been observed on the line of shore between the villages of Fairlie and Portincross, taking in the fields and woods which lie within a hundred yards of it, and also part of Fairlie Roads. The number of species recorded is 114.

To Mr. John Paterson and Mr. John Robertson, and also to Mr. Robert Millar, gamekeeper at Hunterston, I am indebted for much valuable information.

Between Fairlie and Brigaird Spit the receding tide lays bare a vast area of sand and mud, which proves very attractive to the wild-fowl that annually visit this locality, but does not help the observer, as birds are easily passed by when scattered over so large an area.

I have found that from about an hour before high-water to an hour after then is the best time to see what waders and ducks may be present; and if the observer takes his stand at Brigaird Point at a suitable time, the best being when the tide is beginning to ebb about an hour before sunset, he will often see almost the whole feathered population of the Fairlie Sands pass before him.

Mistle-Thrush, *Turdus viscivorus*, Linn.—Common, especially during hard frost.

Song-Thrush, *Turdus musicus*, Linn.—Abundant in autumn, and not uncommon in winter.

Redwing, *Turdus iliacus*, Linn.—
Fieldfare, *Turdus pilaris*, Linn.— } Both species occur in winter, the Fieldfare being the more abundant of the two.

Blackbird, *Turdus merula*, Linn.—The most abundant of all the thrushes here.

Wheatear, *Saxicola œnanthe* (Linn.).—Numerous in August and September, but all have disappeared by the 7th October.

Whinchat, *Pratincola rubetra* (Linn.).—A few to be seen in the autumn.

Stonechat, *Pratincola rubicola* (Linn.).—Rather rare; I have seen it in the months of September, October, and December.

Redstart, *Ruticilla phœnicurus* (Linn.).—This species has only come under my observation on one occasion, namely, on 6th August, 1906, when I observed two at the Burnfoot Point, Fairlie.

Redbreast, *Erithacus rubecula* (Linn.).—Common.

Whitethroat, *Sylvia cinerea* (Bechstein).—Common in August among the tangled vegetation; few are seen after mid-September.

Golden-crested Wren, *Regulus cristatus*, K. L. Koch.—Occurs in the Hunterston Woods.

Willow Wren, *Phylloscopus trochilus* (Linn.).—An abundant species in August and beginning of September.

Sedge-Warbler, *Acrocephalus phragmitis* (Bechstein).—Not common, owing to the scarcity of suitable resorts; a few may be seen in a marsh at Brigaird Point.

Hedge-Sparrow, *Accentor modularis* (Linn.).—Common.

Dipper, *Cinclus aquaticus*, Bechstein.—Always a few about the burn-mouths; and I once saw one flying over the house-tops in Fairlie, which is rather a peculiar place for this bird to be seen in.

Long-tailed Tit, *Acredula rosea* (Blyth).—Observed occasionally on the trees at Poteath, and Mr. John Robertson has seen it near Portincross.

Great Titmouse, *Parus major*, Linn.—Common.

Coal Titmouse, *Parus ater*, Linn.—Occurs at Hunterston.

Marsh-Titmouse, *Parus palustris*, Linn.—Mr. John Paterson saw several at Ardneil Bank, near Portincross, on January 1st, 1897; and he mentions that it was recorded on the authority of Mr. Walter Brown on 4th April, 1892, on the occasion of an excursion of the Andersonian Naturalists' Society to this district.

Blue Titmouse, *Parus cæruleus*, Linn.—Common.

Wren, *Troglodytes parvulus*, Koch.—A common bird about the dry-stone dykes along the shore.

Tree-Creeper, *Certhia familiaris*, Linn.—Mr. John Robertson has seen this bird within a short distance of the shore near Goldenberry.

Pied Wagtail, *Motacilla lugubris*, Temminck.—Abundant along high-water mark from August to October; rare in winter.

White Wagtail, *Motacilla alba*, Linn.—A regular autumn visitor, occurring in small parties at the end of August and throughout September, being most numerous in the latter month. They resort chiefly to the high-water mark, the attraction being the abundance of flies there.

Grey Wagtail, *Motacilla melanope*, Pallas.—Not uncommon about the mouths of the various burns along the shore.

Yellow Wagtail *Motacilla raii* (Bonaparte).—This local species is common in August and September, occurring singly and in small parties.

Meadow-Pipit, *Anthus pratensis* (Linn.).—Fairly abundant.

Rock-Pipit *Anthus obscurus* (Latham).—An abundant bird from autumn till spring.

Spotted Flycatcher, *Muscicapa grisola*, Linn.—A few to be seen in autumn.

Swallow, *Hirundo rustica*, Linn.—Common in autumn.

House-Martin, *Chelidon urbica* (Linn.).—Common; many pairs nest in Fairlie, and the young birds are frequently not out of the nest in the beginning of October.

Sand-Martin, *Cotile riparia* (Linn.).—Rather a scarce species on this shore.

Greenfinch, *Ligurinus chloris* (Linn.).—Common.

House Sparrow, *Passer domesticus* (Linn.).—Abundant.

Chaffinch, *Fringilla cœlebs*, Linn.—Common.

Linnet, *Linota cannabina* (Linn.).—Occurs in small parties in the autumn, and sometimes in winter.

Lesser Redpole, *Linota rufescens* (Vieillot).—Common in autumn, and often seen in winter.

Twite, *Linota flavirostris* (Linn.).—Common; 50 or 60 birds are frequently seen together. A more abundant bird than the Linnet hereabouts.

Bullfinch, *Pyrrhula europæa*, Vieillot. — Have only once observed this species on the shore here; on 23rd November two were seen on the roadside near Southannan.

Corn-Bunting, *Emberiza miliaria*, Linn.—Not uncommon in autumn.

Yellow Bunting, *Emberiza citrinella*, Linn.—Common.

Reed Bunting, *Emberiza schœniclus*, Linn.—Occasionally seen.

Snow Bunting, *Plectrophenax nivalis* (Linn.).—Occurs occasionally in small parties in winter, November 1st being the earliest date I have of its arrival.

Starling, *Sturnus vulgaris*, Linn.—Very abundant. In the warm days of autumn the shore often swarms with Starlings hawking after flies, in the same manner as the more agile Swallows.

Magpie, *Pica rustica* (Scopoli).—I have seen this bird on one occasion near Hunterston, and believe it to be a scarce species hereabouts.

Jackdaw, *Corvus monedula*, Linn.—Abundant, the cliffs north of Portincross being a favourite resort.

Raven, *Corvus corax*, Linn.—On September 1st, 1907, Mr. John Robertson saw a pair flying inland near the Black Rock; and Mr. Millar tells me he has, on several occasions, observed a pair flying in the same direction.

Carrion-Crow, *Corvus corone*, Linn.—Often seen on the flats, generally in pairs.

Rook, *Corvus frugilegus*, Linn.—Abundant; numbers cross Fairlie Roads from the Great Cumbrae every morning, returning in the late afternoon, when they often have a rough passage if the prevailing winds from the south-west and west are blowing strongly.

Skylark, *Alauda arvensis*, Linn.—A few are always about the shore, but after a fall of snow inland they become very numerous. On the morning of the great blizzard of wind and snow on 26th December, 1906, I watched a great movement of this species in a westerly direction (see *Annals of Scottish Natural History*, 1907).

Swift, *Cypselus apus* (Linn.).—Abundant in August, but rarely seen after September 1st. In the fine September of last year (1907), however, a few remained rather later, the last being observed on the 22nd September, a late date.

Nightjar, *Caprimulgus europæus*, Linn.—Mr. Robert Millar has heard this bird in August at Hunterston.

Kingfisher, *Alcedo ispida*, Linn.—Mr. Robert Millar tells me of one occurrence of this bird at the Green Point.

Barn-Owl, *Strix flammea*, Linn.—On 22nd October, 1904, Mr. Knox Whyte shot one in Poteath Bay as it was hovering

over his dog at flight time. In September, 1907, Mr. John Robertson drew my attention to the note of an Owl which he believed to be this species, and since then I have frequently heard the same note behind Fairlie, but never have been able to trace the bird. Mr. Millar is quite familiar with this bird at Hunterston.

Long-Eared Owl, *Asio otus* (Linn.).—In the fine evenings of early autumn I have frequently seen this species hawking about the shore.

Tawny Owl, *Syrnium aluco*, (Linn.).—Fairly common; several may be heard hooting to each other on a still evening.

Sparrow Hawk, *Accipiter nisus* (Linn.).—A frequent visitor to the shore, where it finds abundance of spoil among the small birds.

Peregrine Falcon, *Falco peregrinus*, Tunstall.—This bird is now but an occasional visitor, and the famous eyrie at Ardneil, where, from time immemorial, the Peregrine had its home, is now deserted; but the estate of Hunterston must ever be associated with this falcon. I have observed it on three occasions only. On 25th December, 1901, one was seen at the Black Rock; on 4th October, 1902, while lying up at Brigaird, waiting for the flight of Curlews from Fence Bay, I was startled by the sudden swoop of a fine blue-backed male at a small wader standing in a pool of water within 20 yards of where I was concealed; and on September 30th, 1905, two, in brown immature plumage, were noticed at Poteath Bay. One October evening in 1906, at Poteath, a Peregrine made a dash at the Tam-o'-Shanter worn by a well-known Fairlie wild-fowler, who was snugly ensconsed in the heart of a whin bush, from which projected his conspicuous head-gear; but for what queer kind of fowl the falcon mistook the latter, I am not prepared to say.

Merlin, *Falco æsalon*, Tunstall.—Frequently seen in autumn, and occasionally in winter. It preys chiefly on Dunlins and small birds; these it fairly flies down, not pouncing unexpectedly on them, as that feathered sneak, the Sparrow Hawk, does. Swallows give it considerable trouble to take; and I have seen several long-continued flights out over

Fairlie Roads after these birds, the hawk making repeated stoops, and just as often missing its intended victim, until the latter became tired out, and was then easily taken.

Kestrel, *Falco tinnunculus*, Linn.—Not uncommon.

Cormorant, *Phalacrocorax carbo* (Linn.).—A common bird here. Many follow the flounders which come in with the rising tide. As can readily be imagined, they find this fish somewhat difficult to swallow; one Cormorant which I watched took about ten minutes over the operation.

Gannet, *Sula bassana* (Linn.).—Common in Fairlie Roads until the end of October, when it disappears; and few, if any, are seen until the end of February, when it reappears.

Common Heron, *Ardea cinerea*, Linn.—Frequents the shore all the year round. There is a small heronry of at least a dozen occupied nests in Kelburne, behind Fairlie, from whence the birds flight down to the shore at sunset with great regularity.

Grey Lag-Goose, *Anser cinereus*, Meyer.—Gaggles of Grey Geese on the wing are not an uncommon sight in this district; but, as they rarely alight on the flats in the daytime, I have, so far, been unable to determine to what species they belong. On 13th November, 1906, Mr. Knox White shot a young Grey Lag at flight-time at the Black Rock, and saw another in its company (see *Annals of Scottish Natural History*, January, 1907).

Barnacle-Goose, *Bernicla leucopsis* (Bechstein).—In October, 1903, a small gaggle of this species remained for a few days, and three were shot; this is the only occurrence I know of.

Brent Goose, *Bernicla brenta* (Pallas).—This is a well-known species at Fairlie, and varies greatly in numbers in different years; and the old wild-fowlers tell me that the Bernacle, as they call it, came in much greater numbers in former days. They usually appear at the end of December, but I observed one on 2nd September, 1905—a very early date.

Bewick's Swan, *Cygnus bewicki*, Yarrell.—On 1st January, 1907, I saw three wild Swans in Fence Bay, which I took to be of this species, but I could not get near enough to them to make sure of their identity.

Common Sheld-duck, *Tadorna cornuta* (S. G. Gmelin).—In the beginning of August, broods of young, accompanied by their parents, are common about the shore, where they remain till the end of October, and then depart; but some reappear in January, and many in February, when bunches, containing up to 50 birds, are to be seen in Poteath and Fence Bays.

Mallard, *Anas boscas*, Linn.—A few parties of local birds are usually about in August and September. In October it becomes more abundant by the arrival of others from the north; and this month sees an alteration in their habits, as they become almost entirely night-feeders, and are not so often seen on the flats in the daytime as they were earlier in the season. They generally go inland at night when the the weather is open, and resort to the small sheets of water among the hills, and also to the potato-fields; but in frosty weather they betake themselves to the burns running through the *Zostera*-beds when the tide is low.

Teal, *Nettion crecca* (Linn.).—Fairly common in September and October, and only numerous in winter, when hard weather prevails inland.

Wigeon, *Mareca penelope* (Linn.).—The most abundant of all the ducks here. Small parties make their appearance in September, the earliest date I have being the 12th; and their numbers gradually increase in October and November reaching the maximum in December. At first they mostly feed in Poteath Bay, but with the turn of the year Fence Bay becomes more popular with them. If the tide happens to be out about an hour after sunset, when they flight in from the sea, they alight on the beds of *Zostera*, far out from the shore; but as the night wears on, they approach the shore edges, and may then be seen, if the moon is shining, within 50 yards of the public road bordering Fence Bay. No bird is perhaps better known here than the Wigeon; and although the main object of pursuit of a number of keen wild-fowlers, I very much question if 10 per cent. of their numbers are shot in a season.

Tufted Duck, *Fuligula cristata* (Leach).—Rather rare here, but occasionally a solitary bird is observed. I have only once come across a number together, namely, one frosty morning in November, when about 40 were noticed at the Black Rock.

Scaup-Duck, *Fuligula marila* (Linn.).—On 16th February, 1907, after a spell of stormy weather, Mr. Alexander Ross and I saw a party of six in Fence Bay—the only occurrence I know of.

Golden Eye, *Clangula glaucion* (Linn.).—Not very common; a few about Brigaird Point from October onwards, generally adult males.

Red-Breasted Merganser, *Mergus serrator*, Linn.—A common bird here all the autumn, and slightly less so in the winter. Many young birds, unable to fly, are regularly seen in August and September.

Ring-Dove, *Columba palumbus*, Linn.—Not so common as it used to be, owing, I am told, to the farmers having ceased to sow rape after the potato crop; but it still remains numerous enough for all concerned.

Stock-Dove, *Columba œnas*, Linn.—Only within recent years has this species become common here, as it was entirely unknown fifteen years ago. It is now well known, and flocks of 15 to 25 birds are often seen feeding in the fields. Together with the Ring-Doves, they come down to the shore shortly after sunrise, to pick gravel and drink the brackish water, and are frequently seen crossing Fairlie Roads to the Cumbraes.

Rock-Dove, *Columba livia*, Gmelin.—On 2nd January, 1905, I flushed one from the shore at the Green Point.

Red-Grouse, *Lagopus scoticus* (Latham).—Although I never actually observed this bird on the shore, it occurs very close to it, and may be heard from there. The Black Grouse is to be met with further inland.

Pheasant, *Phasianus colchicus*, Linn.—Frequently visits the shore.

Partridge, *Perdix cinerea*, Latham.—Common close by the shore.

Corn-Crake, *Crex pratensis*, Bechstein.—I have heard this bird calling at Hunterston as late as the 6th August.

Water-Rail, *Rallus aquaticus*, Linn.—I know of only two occurrences of this species. One was shot by Mr. Neilson on 7th November, 1903, at Poteath; and another was obtained by Mr. R. Garry in February, 1907, at Fencefoot.

Moor-Hen, *Gallinula chloropus*, (Linn.).—Not uncommon in the small marshes close by the shore.

Ringed Plover, *Ægialitis hiaticola* (Linn.).—Very common.

Golden Plover. *Charadrius pluvialis*, Linn.—Flocks of these birds appear with great regularity in September and October. In winter, when the weather is open, few are to be seen; but a change to frost or snow never fails to bring them down to the shore with a rush.

Grey Plover, *Squatarola helvetica* (Linn.).—Appears to be a regular autumn visitor in scanty numbers, October or November being the months in which it is usually observed. I have seen it as early as 6th September, and as late as 2nd February. First noticed in 1904, it has occurred every year since.

Lapwing, *Vanellus vulgaris*, Bechstein.—A very abundant bird here; sometimes in October and November the shore simply swarms with them. During continued frosty weather they disappear, but with the return of open weather they reappear, though always in lessened numbers. They become very lively at dusk, when they come trooping down to the flats, turning and twisting about, and calling loudly to each other.

Turnstone, *Strepsilas interpres* (Linn.).—From the middle of August till the end of the season, a few frequent the rocky shore about Brigaird Point; but they never occur in such large numbers as in some other parts of the Clyde area.

Oyster-Catcher, *Hæmatopus ostralegus*, Linn.—About 200 Oyster-catchers spend the winter on the Fairlie sands, feeding when the tide is out, and crossing to the Little Cumbrae at high water. Some evidently nest on this shore, for I have seen the young, still in down, at Brigaird Point in August.

Woodcock, *Scolopax rusticula*, Linn.—Common enough in several parts of this district, I am told; but it is not often seen on the shore, and I have only come across it on two occasions.

Common Snipe, *Gallinago cœlestis* (Frenzel).—Generally a few occur in certain favoured spots, always becoming more numerous during hard weather. Many come out to the flats

after dark, and even in the day-time some are to be seen about the tangle-covered rocks, where I have noticed them retreating before the advancing tide.

Jack Snipe, *Gallinago gallinula* (Linn.).—Not abundant on the shore; I have seen an odd one now and then from October onwards.

Dunlin, *Tringa alpina*, Linn.—This is a species which varies much in numbers in different years, being very abundant in some seasons and quite the reverse in others. Last season (1907-8) they were very scarce; during August and September, only solitary birds were noticed; and although they became much more numerous after October, they did not occur in anything like their usual numbers.

Purple Sandpiper, *Tringa striata*, Linn.—Evidently a rare bird here. Mr. John Paterson observed three on the rocky shore at Portincross on January 2nd, 1899.

Knot, *Tringa canutus*, Linn.—A regular autumn visitor, arriving from the 16th of August onward, and remaining till about the middle of November, when all have passed on; but they are again observed at the end of February, on their way north. They are the most numerous of the Arctic waders here, 50 or 60 birds being frequently seen together, and are usually very tame. I have but rarely heard this bird utter its note, and think it one of the most silent of all the waders.

Common Sandpiper, *Totanus hypoleucus*, (Linn.).—Occurs in August and September in small numbers.

Redshank, *Totanus calidris* (Linn.).—Abundant. Often at full tide I have seen a large flock of these birds, numbering from two to three hundred, flying about the Black Rock. This is quite contrary to the experience of a well-known wild-fowler, who denies the fact, often alluded to, of the Redshank gathering into large flocks.

Greenshank, *Totanus canescens* (Gmelin).—A regular autumn visitor, occurring sometimes as early as August 4th, and frequently seen till October. In winter it is rare, and I have only observed it in December on one occasion. No bird is more wary than the Greenshank, in my experience, not even excepting the Curlew, which has acquired a great and well-merited reputation in this respect.

Bar-Tailed Godwit, *Limosa lapponica* (Linn.).—Fairly common some seasons and in others rare. It is most frequent in the three autumn months, but an odd bird occurs now and then till the end of February. Sixteen is the largest group I have seen together.

Common Curlew, *Numenius arquata* (Linn.).—A very abundant species from autumn to spring. During August and September they go inland at high water, and begin to return to the flats about two hours after the beginning of the ebb, flighting down in flocks from twenty to one hundred strong. As nearly all use the same route, it is possible at this season to form an estimate of their numbers. After observing them closely for the last seven years, I would say that the average autumn Curlew population of the Fairlie sands is between six and seven hundred individuals. After October they do not go inland so much, and it is therefore not so easy to judge what the winter population is. From this change of habit, and their perceptibly increased tameness in this month, when they will fly over certain parts which, owing to the attentions of the shore-shooters, were shunned weeks before, I believe that the birds present in autumn depart about the middle of this month (October), and are replaced by others from the north. Curlews seem to depend on their great powers of sight for their protection, and not on any sense of smell. One very hot day in August, a Curlew alighted, and commenced to bathe itself in a pool of water, within three feet of a stone butt within which I was concealed; and although I watched it for nearly ten minutes ducking its breast in the water, and allowing the latter to trickle over its shoulders, it was not until I showed myself that a much-startled Curlew flew shrieking away.

Whimbrel, *Numenius phæopus* (Linn.).—A few are seen up till October every year, generally solitary birds. They appear with great regularity in the first week of August.

Common Tern, *Sterna fluviatilis*, Naumann.—Common in flocks in August and the first half of September. Though constantly on the outlook for its near relative, the Arctic Tern, I have not yet managed to identify it here.

Black-Headed Gull, *Larus ridibundus*, Linn. } Both very com-
Common Gull, *Larus canus*, Linn. } mon birds here.

Herring-Gull, *Larus argentatus*, Gmelin.—By far the most abundant gull on this shore, very large numbers being constantly seen. On their daily journey from the inland fields to the flats, this and the preceding two species use the same route with such great regularity that the part of the shore over which they pass has become known as the "Gulls' Walk."

Lesser Black-Backed Gull, *Larus fuscus*, Linn.—Common till October, when they depart, and are not observed till the return of spring.

Great Black-Backed Gull, *Larus marinus*, Linn.—One or two of these fine birds are generally to be seen beating along the margin of the tide in search of flotsam and jetsam.

Kittiwake Gull, *Rissa tridactyla* (Linn.).—Common in Fairlie Roads.

Pomatorhine Skua, *Stercorarius pomatorhinus* (Temminck).—On February 17th, 1904, Mr. Robert Godfrey picked up a dead example of this bird at Hunterston (*Annals of Scottish Natural History* for 1904, page 192).

Richardson's Skua, *Stercorarius crepidatus* (Gmelin).—Since November 1st, 1902, when I obtained one at Brigaird Point, I have seen it on some half-dozen occasions, once as early as August 13th, 1904. All the birds seen were in the dark phase of plumage.

Razorbill, *Alca torda*, Linn. } Both common species in the autumn
Guillemot, *Uria troile* (Linn.). } months in Fairlie Roads.

Addenda.

Since this paper was read to the Society, two additional species have come under my notice.

On September 25th, 1909, I observed a Common Buzzard, *Buteo vulgaris*, Leach, soaring over the rising ground behind Poteath Bay, just outside our limit; and in the same month I obtained a Puffin, *Fratercula arctica* (Linn.),—a bird of the year—off Brigaird Spit. The Common Buzzard is a rare species over the most of Ayrshire; but the Puffin no doubt occurs frequently with the Guillemot and the Razorbill in Fairlie Roads.

Notes on Leaf-sections of *Polytrichum*.

By John R. Lee.

[Read 23rd June, 1908.]

The Polytrichaceæ represent the highest type of organisation amongst Mosses; and, in fact, present us with the most highly organised form of the gametophyte or sexual generation in plants. Not only is there a robustness of aspect in most of the species, which is almost unique, but the histology of the stems and leaves presents a complexity of structure far surpassing that of any other group of the Bryophyta. Although it cannot be said that there is anything quite comparable with the elaborate fibro-vascular tissues of the plant-body in Phanerogams and Pteridophytes, yet there are present in the conductive system of the Polytrichaceæ elements which recall the fibres, vessels, and and sieve-tubes of the higher plants, and have, in fact, been regarded as analogous structures by some observers.

Connected with this highly-specialised conductive system, it is not surprising to find a type of leaf-structure more elaborate than is usual amongst the other groups of mosses. Although, in general, the central mib-rib or "nerve" of the leaf presents a certain amount of complexity, yet in the great majority of mosses the leaf is extremely simple in structure, the greater part usually consisting of a simple plate of cells, filled with chloroplastids. In the Polytrichaceæ, on the other hand, the "nerve," which is unusually large, bears, on it ventral surface, a number of plates, or "lamellæ," running parallel to each other in a longitudinal direction, and appearing in transverse section as a series of upright rows of cells. In the genus *Catharinea*, these lamellæ are few in number—not more than four or six—and are comparatively narrow, the broad lamina of the leaf considerably exceeding the lamellæ in extent of surface; while the cells of the lamellæ, as well as those of the leaf-blade itself, contain abundant chlorophyll. In the genus *Polytrichum*, on the other hand, the lamellæ are very numerous—as many as sixty in *P. commune*—and are the only chlorophyllose parts of the leaf, the lamina being in many cases reduced to a very narrow wing at the extreme edge of the extended "nerve."

The position of the lamellæ, when the leaves are expanded in the moist condition, is evidently an adaptation to their function as the assimilatory tissue-system of the plant. They then stand vertically upon the expanded leaf, with their surfaces in line with the incident light-rays. The arrangement, in fact, strongly recalls the "palisade cells" in the ordinary bifacial leaf of dicotyledons.

Like all mosses, the species of *Polytrichum* are liable to loss of water during dry weather, and are well adapted to endure desiccation. Their elaborate leaf-structure presents some interesting points of adaptation to such conditions. In all the species there is a broad sheathing leaf-base, from which the lamellæ are for the greater part absent, the lamina being here expanded, and consisting of thin-walled hyaline cells. In some species—as, for example, in *P. juniperinum*—this sheathing base is not very extensive; and, in that case, the marginal ring is broader, and folds over the lamellæ in the dry condition. In other cases, the leaves become closely adpressed to the stem, thus affording a similar protection to the lamellæ. This movement of the leaves is due in large measure to contraction of the sheathing base, owing to the withdrawal of water from the thin-walled tissue of which it is composed, but also in part to contraction of the lamellæ themselves from a similar cause. The cells of the lamellæ are mostly thin-walled, and readily absorb moisture, both in the liquid form and as atmospheric vapour; but the external walls of the cell-row which form the upper free edge of the lamellæ are strongly and characteristically thickened. When the leaves dry up, the lamellæ became closely packed together, the only part exposed to the air being thus this thickened upper edge.

The thickening of the outer row of cells in the lamellæ differs in form in the different species. Thus in *P. urnigerum* the wall is covered with wart-like papillæ. This is also the case in *P. alpinum*. In *P. juniperinum* there is a strong ridge of cellular thickening on the upper edge of the cell-row, and two lateral ridges less strongly marked, giving the appearance of a roughly cruciform cell, as seen in section. *P. piliferum* agrees in form with *P. juniperinum*, but the lateral ridges are almost obsolete. In *P. commune* the edge of the lamellæ is grooved longitudinally, giving the appearance of a bicuspidate cell in section.

Meteorological Notes and Remarks upon the Weather during the Year 1907, with its General Effects upon Vegetation.

By James Whitton, Superintendent of Parks, Glasgow.

[Read 31st March, 1908.]

In order to preserve the continuity of the series, these notes have been compiled, as in former years, from the records kept at Queen's Park, Glasgow.

January.—The new year was ushered in with weather conditions of an unpleasant nature. The morning was dull and cold, while at night a storm of wind and rain set in, which continued throughout the following day. After a slight touch of frost on the 3rd and 4th, rain, intermixed with hail and sleet, again occurred on the evening of the latter, and continued irregularly for a few days. Then the weather moderated, and for about a fortnight it was unseasonably open and mild, the 17th being a remarkably fine, spring-like day. After the 18th it was more wintry in character, with some sharp frosts, 14° being registered on the 24th, while on the same day the first fall of snow of the season occurred. The wintry conditions lasted until the 27th, when a strong, fresh wind sprang up, which quickly dispelled all the snow from the ground. On the 28th a severe gale, which lasted over the 29th, sprang up, and was accompanied with thunder, lightning, and rain. A considerable amount of damage was caused throughout the country by this storm. The last two days of the month were dry and frosty.

The barometrical readings show a wide range. On the 1st the atmospheric pressure indicated was 29·10 inches; on the 2nd it was down to 28·70, from which point it rapidly rose to 29·90; on the 4th, with four exceptions, the pressure was over 30·00 inches daily until the 27th, when a sharp depression set in, followed by the gale of the 28th and 29th. The readings for these days were 29·30 and 29·10 inches respectively. The highest

reading for the month was 30·75 inches on the 23rd. After the 29th there was a sharp rise to 30·05 on the 31st.

Frost was registered on ten occasions, these being chiefly during the latter half of the month. The amount registered was 55°. This is a greater amount than what was registered in January of the three preceding years, especially that of January, 1906, when the total was only 9°; in 1905 the amount was 33°, and in 1904, 28°. While the average maximum temperature (43°) was the same as that of January, 1906, the average minimum (35°) was 2° lower.

The rainfall was 2·12 inches, which is slightly under that of the same month of 1906, when the amount was 2·62 inches. On no occasion was the day's rainfall excessive, while there were 13 days on which no rain fell.

With the open and comparatively mild weather, vegetation early showed signs of activity. The buds on Willows and Elders swelled up considerably, and Narcissi and Snowdrops were showing through the surface of the ground during the second week of the month. Grass lands were remarkably bright and green for the season, and birds were in song prior to the period of frosts.

February. — Sharp frosts were experienced during the first week, with a fall of snow on the 4th, while on the 5th and early part of the 6th the city was enveloped in a dense fog. A change to fresh set in on the 7th, but the thaw did not last long, and, with the wind veering back from S.W. to N.E., there was a recurrence of the wintry weather. A brilliant display of the aurora was witnessed on the evening of the 9th. From the 15th until the 20th very stormy weather was experienced, with heavy, cold rains. Thereafter till the end of the month the weather was seasonably fine and settled.

The barometrical readings were much lower than those of the preceding month, and, in consonance with the weather, somewhat erratic. The pressure was above 30·00 inches during the first five days and last four days of the month; the highest point was 30·35 inches on the 5th. The main range of pressure was between 30·00 and 29·00 inches, and only on one occasion was it below the latter point, when during the stormy period it touched 28·40 on the 20th.

There were 15 dry days, and the rainfall (including melted snow) amounted to 2·68 inches, which quantity is about the

average for this month. On two occasions the fall for twenty-four hours was over half-an-inch, 0·65 inch being registered on the 17th and 0·55 inch on the 20th.

Frost was registered on 12 days, the total amount being 76°, which was less than in the corresponding month of 1906, when a total of 92° was registered for 19 days. The average maximum temperature was 41° and the average minimum 32°, compared with 42° and 30° respectively for February, 1906. The lowest readings were 19° on the 1st, 21° on the 5th, 21° on the 6th, and 23° on the 23rd, after which no frost was registered for the month.

Consequent on the wintry character of the weather, vegetation made little apparent progress in the early half of the month. The first Snowdrops observed in bloom were on the 10th; but as soon as the frosts gave way they bloomed profusely, and were in their glory during the last week of the month. The Winter Aconite *(Eranthis hyemalis)* began to bloom during the third week.

March.—With the exception of heavy rain on the night of the 1st and morning of the 5th, the weather during the first week was comparatively mild and dry. The afternoon of the 7th was wet and stormy, which conditions prevailed throughout the 8th. On the 9th frost set in, and snow began to fall during the afternoon; and on the morning of Sunday, 10th, it lay to a depth of fully 4 inches. Under the influence of bright sunshine and a strong westerly wind, which began about mid-forenoon of that day, the snow rapidly disappeared, and by 8 p.m. very little was left on the ground. Several fine days were experienced, and were followed by a week of changeable weather, with occasional heavy rains. From the 20th until the end of the month the weather was fine and bracing, with several bright days of sunshine.

Though somewhat irregular during the early half of the month, the atmospheric pressure was fairly high throughout, ranging between 30·10 inches on the 1st to the same point on the 12th, when there was a steady depression during the period of changeable, squally weather to 29·20 on the 16th, with a remarkably quick drop to 28·50 on the 17th, which presaged the heavy rainfall registered on that date. After the storm the pressure quickly increased till it reached 30·25 inches on the 23rd, and

remained over 30·00 for a week, dropping a few points on the three last days of the month.

Rain fell on 16 days, the total amount registered being 3·94 inches, which is slightly above the average for March. There was an abnormal amount registered on the morning of the 17th, when the gauge showed 1·05 inches.

The amount of frost registered was only 15°, occurring on 5 days. In March, 1906, there was a total of 60°, occurring on 10 days. Owing to the absence of severe frosts, the average temperatures—maximum, 49°, and minimum, 37°—were in each case 4° higher than those for the previous March.

With the freedom from hard frosts and openness of the weather, combined with the lengthening days and growing power of the sun, vegetation rapidly showed signs of awakening. By the 10th the Snowdrops, which had bloomed well, began to pass, to be succeeded by Crocuses and other spring flowers. During the third week the Crocuses were in their glory, while Daffodils were showing colour in their buds, and before the close of the month the Common Daffodil *(Narcissus pseudo-narcissus)* was in full bloom. In the last week Dog-tooth Violets, Squills, and Hepaticas were also in flower. Amongst trees the advance was equally great, Elms showing the rosy red of their buds more brilliantly than usual. Catkins on Willows, Hazels, and Alders were also striking; and the buds on Thorns, Lilacs, Roses, and many other shrubs showing green too freely for the period of the year. *Daphne Mezereum* was beautifully in bloom, along with *Rhododendron Nobleanum* in sheltered places. Grass lands were also very fresh and bright.

April.—The fine weather which prevailed during the latter part of March continued for a time. A slight thunderstorm occurred on the 2nd, and there was a heavy fall of rain during the evening of the 3rd. Thereafter, though fine on the whole, the weather became colder, with a tendency to frost in the mornings. On the 10th another thunderstorm, accompanied by heavy rain, was experienced, the afternoon being very wet. With easterly winds, the weather kept dry and cold until the 20th, when, with a change of the wind to the S.W., rain fell. The weather thereafter, though somewhat changeable for several days, was fine, on the whole, until the end of the month.

The atmospheric pressure was within a moderate range, though somewhat erratic in course. From 29·70 inches on the 1st, it fell to 29·00 inches on the 3rd, rising again to 29·50 on the 5th, while on the 6th it was again down to 29·00 inches—the only occasions during the month when that point was touched. The rise was steady, but only on one occasion did the pressure reach 30·00 inches, this occurring on the 25th. A steady decline followed, and on the 30th the barometer indicated 29·40 inches.

For the third year in succession the rainfall for this month was low, the amount registered being 2·30 inches, and there were 18 dry days. In the corresponding months of 1906 and 1905 the rainfall was 1·21, with 19 dry days, and 1·79 inches, with 15 dry days, respectively.

In regard to the temperature, while the average maximum (52°) was 2° lower than that of April, 1906, the absence of frost accounts for the higher average minimum, which was 39°, or 4° above that of the previous April. Though the freezing point was approached on several occasions, only on one morning (the 18th) was frost registered, and that only to the extent of 2°—a somewhat remarkable record for April.

The move which vegetation had made in the latter part of March continued vigorously during the first week, but the cold easterly winds and lack of moist, genial conditions considerably retarded its development during the month. Those trees which naturally leaf early, and which had made some progress, were severely checked by the touch of frost on the 18th, the young shoots and leaves of Chestnuts and Sycamores, as well as the flowers of Rhododendrons—*R. Nobleanum*, *R. Jacksoni*, and *R. præcox*—being badly browned. The effects of the frost were not so apparent on Lilacs, Thorns, Spiræas, but all were retarded. The frost, however, did not harm the early hardy flowers, such as the *Narcissi* and their spring congeners, and the display of Daffodils was fine during the month. Field crops were planted under satisfactory conditions generally, and grass lands were in excellent order for the period of the year.

May.—Opening with a cold, dull, wet day, the weather until the 13th was changeable, rain and sunshine alternating, with perhaps more of the former than of the latter. A severe gale of wind was experienced on the 2nd, while on the 8th and 11th

thunderstorms occurred. The third week was cold and dry, with a prevalence of easterly winds. Rain was registered on the 22nd, 23rd, and 24th, but, with these exceptions, dry weather prevailed until the last two days, both of which were extremely raw and disagreeable.

With the exception of the change which occurred from 29·60 inches on the 1st to 28·80 inches on the 2nd, when a gale of some severity was experienced, the range of atmospheric pressure was moderately high, with no outstanding feature of variation. The range was chiefly between 29·40 and 30·00 inches, the latter point being only slightly exceeded on the 17th, 18th, and 19th, and again on the 28th and 29th, with the pressure rapidly declining on the 30th and 31st, when it was down to 29·50 inches.

Rain fell most frequently in the early part of the month, the total amount registered being 3·63 inches, which is slightly under what was registered in the previous May. There were 13 dry days.

The absence of sunshine and the prevalence of cold winds had their natural effect on the day temperature. The average maximum consequently is low, only 53°, which is 1° lower than that of May, 1906. In the case of the average minimum, which was 43°, it is 1° higher than that of the previous May, while the figures were 4° and 2° respectively lower than those of May, 1905.

While the rains of the early part of the month had a vivifying effect on vegetation, the gain was counterbalanced by the unseasonably cold, sunless weather experienced during the latter part, consequently growth was slower and later than usual. The gale on the 2nd sadly mutilated the young, soft foliage of Acers and Chestnuts, also destroyed much of the bloom on Rhododendrons. The display of bloom on most deciduous trees and shrubs was more irregular than usual, some specimens being profuse and others sparsely flowered. Pears, Cherries, and Plums in some places were fine, and in others under the average, though it may be noted that the most profusely bloomed plants do not usually set fruits so well as those more moderately flowered. While the leafing of trees was later than usual, the absence of "May frosts" permitted the development without injury, and the foliage of the later species was fully above the average in size and quantity.

The leafing of the Oak on the 13th and the Ash about the 25th was similar in time to the previous year. Seeds in garden and field generally made a good start in growth, but many of the more tender sorts developed imperfectly, or failed entirely in growth afterwards, on account of the want of genial weather conditions.

The Cuckoo was heard on the 14th, and House-Swallows observed on the 16th.

June.—There was no improvement in the weather conditions with the advent of what is usually one of the most pleasant months of the year. Rarely indeed do we experience such a prolonged spell of cold, cheerless, sunless weather in June. Heavy showers of rain, and occasionally hail, fell on most days of the month, while local thunderstorms were somewhat frequent. On the 29th, which was a remarkably pleasant day, during the prevalence of one of these storms, there were parts of the city deluged for a short time at different periods of the day, whilst in some parts not a drop of rain fell.

The barometric readings do not show either a wide range or any notable change in the atmospheric pressure. On the 1st it was at 29·60 inches, varying only a few points up and down till the 17th, when it touched 29·90 inches, falling about four points the following day, and keeping very steady thereafter till the 24th, when it fell to 29·30 inches, rising slowly afterwards to 29·90 inches on the 30th.

The character of the weather may be gauged by the fact that only on 6 days was no rain recorded. The total amount of rainfall registered was 3·99 inches. In June, 1906, there were only 1·69 inches of rain and 17 dry days.

With an abnormal rainfall and absence of sunshine the temperature was low, the average maximum being 57°, and the average minimum 47°, compared with 65° and 50° respectively for the corresponding month in 1906. In that year the maximum thermometer in shade was above 70° on four occasions, and above 60° on twenty-six, whereas in the year under review it was only six times above 60°, the highest reading being 63° on the 11th.

Consequent on the somewhat abnormal conditions, vegetation made but slow progress. Hawthorns were but bursting into bloom during the second week, and flowered very irregularly.

This was also a marked feature with Laburnums and other subjects which usually make a gay display in garden and woodlands in June. In fact, the majority of what are termed flowering shrubs were below the average in bloom. There was, however, a compensating gain in growth, as the young shoots and leaves developed more fully than usual, Rhododendrons especially being exceptionally good. Considering the amount of rainfall the fields of cereals looked well. Potatoes were somewhat patchy, and turnips irregular, as on wet soils the seed was not sown under good conditions; in fact, in many places it was not sown at all, on account of the impossibility of working the soil.

July.—Although a considerable amount of rain fell during the first two weeks, the tendency was towards improvement. This was very marked after the 13th (Glasgow Fair Saturday), which was a wet, dull, depressing day. From the 14th to the 26th the weather was ideally fine, and enabled our citizens to enjoy their "Fair" holidays under delightful atmospheric conditions. Indeed, the fortnight was probably the best, so far as weather is concerned, throughout the year. The conditions were exactly the reverse of what was experienced during the "Fair" holidays of 1906, when the proverbial bad weather was perhaps more pronounced than usual. During the dry weather the winds were chiefly from the S.E., with a change of the wind to the S.W. on the 27th. There was some rain for a few days, but not so heavy as to cause much discomfort.

The atmospheric pressure was somewhat irregular for the first ten days. From 29·80 inches on the 1st and 2nd, it steadily fell to 29·35 inches on the 6th, recovering three points the following day, then dropping to 29·40 on the 8th, after which the pressure steadily increased, and the highest reading for the month was on the 16th, when 30·40 inches was indicated. After that date the pressure declined steadily, and was at 29·70 inches on the 31st.

The rainfall amounted to 3·38 inches, occurring on 16 days. The rainfall for July, 1906, was 2·37 inches, with 9 dry days; and in the corresponding month of 1905, 2·81 inches, and 12 dry days.

Regarding the temperature, the average maximum (63°) was 1° lower and the average minimum (50°) the same respectively

as those of the previous July. The maximum thermometer in shade was at or above 60° on twenty-three occasions, and above 70° on four occasions, the highest reading being 78° on the 18th. In July, 1906, the highest reading was 72° on the 5th, and only twice was it above 70°.

The continuous wet weather having chilled and soddened the soil, vegetation was in a stagnant state until the dry, sunny period came on, after which the change was remarkable, and a fine healthy colour was assumed by annual crops. Haymaking was in full swing by the 20th, and many farmers got their hay crop secured in a satisfactory condition. Trees and shrubs completed their annual growth very fully, and garden plots of summer plants, which were in a languishing state, revived and grew vigorously.

August. — The month opened fine, but unfortunately the weather broke down, and the conditions were by no means pleasant, as these were very changeable, with heavy rains and high winds at times, while towards the end of the month hail showers were too frequent for the season.

While the barometric readings do not show a wide range, they indicate a somewhat unsteady line of atmospheric pressure. The pressure rose a point from the 1st to the 2nd, when it was at 29·80 inches, then varying a point or two up and down daily till the 10th, when the lowest reading for the month (29·30 inches) occurred. On the 13th it was at 29·80 inches, and for a week several points lower, rising steadily after the 17th, till on the 22nd it indicated 30·00 inches. During the last week it varied between 29·55 on the 25th and 29·90 inches on the 30th, with a downward tendency on the 31st.

As in the previous August, which had an amount (5·28 inches) above the average, the rainfall was again heavy for this month, the amount registered being 4·65 inches, with only 7 dry days.

The heavy rainfall and absence of sunshine had again a marked effect on the temperature, consequently the averages are low for the month, the average maximum being 60°, and the average minimum 49°, in both cases lower than those of the previous August. In August, 1906, the maximum thermometer in shade was five times above 70°, and only twice below 60°; whereas in the month under notice it was sixteen times below and but fifteen times above 60°, while the highest reading was 67° on the 21st.

Owing to the changeable, wet weather, field crops made little progress towards ripening. Cereals certainly made plenty straw and looked well, but few fields were showing change of colour towards the end of the month. Root crops were soured and sickly, except on favoured spots. In late and high-lying parts the hay crop, where uncut or unsecured, got much wasted in colour and quality. Towards the end of the month the defoliation of the Lime and Elm trees in the city parks became somewhat pronounced, though fully ten days later than usual.

September.—During the first week the weather was somewhat variable, several days being fine till evening, and then becoming wet. The tendency, however, was towards more settled conditions, and after the 5th very little rain was registered; in fact, after the 17th there was not any. The weather became warm and dry, though somewhat hazy at times, and the atmospheric conditions were of a very delightful description.

With the variable weather of the first week the atmospheric pressure was erratic. From 29·85 inches on the 1st it fell to 29·20 inches on the 2nd. Thereafter it increased, till on the 8th and 9th it was at 30·30 inches, the highest reading for the month. For several days the pressure declined slightly, then rose a point or two and kept steady until the 22nd, when from 30·25 inches it gradually eased off to 29·50 inches on the 26th, then rising as the month closed.

The rainfall was low, only 1·24 inches being registered. There were 18 dry days. These conditions were somewhat similar to those of the previous September, when the rainfall was 1·41 inches, with 21 dry days.

Though there was a slight tendency towards frost in the first week, no frost was registered, except by the radiating thermometer on the surface of the grass. No damage, however, was caused to plants. The average maximum temperature was 60°, and the average minimum 48°, the former 2° lower and the latter 1° higher than the respective figures of the previous September.

The warm, genial weather rapidly brought cereals to ripeness, and harvesting operations were in full swing by the second week. Unfortunately, owing to the absence of wind, most mornings were too dewy to admit of cutting or leading in the grain until mid-day, therefore harvesting operations were much hindered. The

warm weather, however, was, after the long period of cold and wet, very much welcomed. Towards the end of the month the trees in the city parks defoliated rapidly. Though later than usual in beginning to fall, the leaves of Limes, Elms, Sycamores, and Beeches were all off about the same period as in former years. The display of autumn flowers was above the usual, and made up for the meagre display made by their summer congeners.

October. — The warm weather which prevailed during the greater part of September did not continue beyond the first few days of this month. Towards the end of the first week the weather became dull and cold, with slight showers, which were the precursors of a very prolonged period of heavy rains. On the 6th the rain fell almost continuously, and by 9 a.m. on the 7th over an inch was registered. With a day's respite rain again set in, and for about three weeks it fell more or less continuously, one day's fall being somewhat phenomenally heavy. After the 26th the weather was more settled and colder.

Though the barometric readings are within a moderate range, the changes in the atmospheric pressure indicate pretty clearly the variable nature of the weather. From 29·35 inches on the 1st the pressure fell to 29·10 inches on the 2nd, then, rising sharply, it was at 29·70 inches for two days—4th and 5th. A sharp depression on the 6th and 7th brought it down to 29·20 inches. A gain of several points followed, and the pressure kept fairly steady until the 14th, when another sharp fall occurred to 29·00 inches on the 15th. Rising slightly for two days another quick depression was noted, the pressure indicated on the 18th and 19th being 28·90 inches. The recovery was sharp, and the pressure kept within two points of 29·50 inches without any notable variation until the end of the month.

Rain was registered on 27 occasions, there being thus only 4 dry days. The total amount was 6·67 inches, an abnormal amount for one month. Nearly half of the amount fell on two days—the 6th and the 15th. The total for the twenty-four hours ending at 9 a.m. on the 7th was 1·01 inches, and for the twenty-four hours ending at the same time on the 16th, 2·27 inches. In the corresponding month of 1906 the rainfall amounted to 5·33 inches, with 5 dry days, so October has been an excessively wet month two years in succession.

The prevalence of easterly winds, combined with an excessive rainfall, kept the temperature low, so that the average maximum (52°) is 3° lower than, and the average minimum (43°) the same as, the figures for October, 1906. No frost was registered during the month.

The prevalence of so much wet weather was most disastrous to grain crops in the later parts, and harvesting operations were practically suspended during the month, even where the situation was more favourable. The defoliation of deciduous trees was very complete ere the month ended, and vegetation generally had a very bedraggled appearance.

November.—The weather during the first week was mild and pleasant. Heavy fogs enveloped the city on the 6th and 7th. Thereafter it became colder and more unsettled—rainy, disagreeable days alternating with fine, mild ones. On the 12th heavy rain fell, accompanied by a strong wind at night. Several days afterwards the weather was fine and settled, and frost occurred on the 15th, with the usual accompaniment of fog in the city, and the day following was wet and disagreeable. The next week was one of better weather. After a heavy rain on the 22nd colder weather prevailed, with dense fogs on the 25th and 30th, when frosts again occurred. The 26th was a very stormy day, with showers of sleet.

The changeable nature of the weather is well shown by the erratic line of atmospheric pressure, as indicated by the barometer readings. On the 1st it was at 29·90 inches. After a slight fall on the 2nd the pressure steadily increased to 30·10 inches on the 6th, then fell rapidly to 29·40 inches on the 9th, recovering five points on the 10th. Three days later it was back to 29·40 inches, while, after a sharp rise, it was at 30·10 inches on the 18th. With a little variation it was about 30·00 inches until the 21st, when a steady depression set in, and by the 27th it was down to 28·90 inches. A very sharp rise followed, and 30·30 inches was indicated on the 30th.

The rainfall was below the average for November, the total being 2·31 inches. There were 12 dry days. In November, 1906, there were also 12 dry days, but the rainfall was 4·17 inches.

Regarding the temperature, frost, totalling 28°, was registered on seven mornings. The average maximum temperature was,

48°, and the average minimum 38°, these being 1° and 3° lower respectively than those of the previous November, which, however, were higher than usual on account of the absence of frosts.

Until the occurrence of frost on the 15th many plants kept blooming out of season. Dahlias, for example, were quite fresh and in better condition than in October, and that precocious blooming plant, *Jasminum nudiflorum*, had many flowers open during the month. Farmers who had fared badly in the gathering in of their crops made the most of the few opportunities to stack grain, while the uncommon and undesirable sight of fields of grain in stook in November was too frequently met with.

December.—After the 1st, which was a dry, frosty day, the weather was very changeable, with a considerable amount of rainfall. These conditions prevailed for the first fortnight. A few fine days with frost at the middle of the month were followed by several wet days, but after the 23rd the weather was dry but dull, with cold easterly winds.

In regard to the atmospheric pressure, the readings again show a wide and erratic range. On the 1st the pressure was 30·00 inches; after a rapid fall it was 28·70 inches on the 5th; on the 7th it was up to 29·30, but on the following day it was back to 28·60 inches, which point was also indicated on the 10th. A rapid rise to 29·20 inches on the 12th followed, then falling again to 28·80 on the 14th. On the 15th it was up to 29·70 inches, and kept near that point until the 19th, when another depression began, and the reading on the 21st was 29·30 inches. A steady recovery followed, and on the 24th and 25th the pressure was 30·00 inches. During the next four days the readings were four points lower, rising again to 30·00 inches on the 30th, with a falling off of a point on the last day of the year.

The amount of rainfall registered was above the average, it being 5·58 inches. On five occasions the rainfall for the twenty-hours exceeded half-an-inch, while on other four days over one quarter of an inch fell. There were 11 dry days. In the previous December the rainfall amounted to 3·51 inches, with 15 dry days in the month.

Consequent on the abnormally mild and open weather the temperature was high for the season of the year. Frost was registered only on five mornings, while the amount was but 19°

in all. The average maximum temperature was 44°, and the average minimum 36°, compared with 42° and 33° respectively for December, 1906.

Owing to the absence of hurtful frosts and the heavy rains vegetation at the close of the year was cleaner and brighter than usual. Too frequently at this season shrubs in the vicinity of the city are heavily coated with a sooty deposit which is inimical to their well-doing in every sense. Grass lands were also remarkably fresh and green. The wet conditions, however, were against the working of arable lands and the securing of root crops.

Comparing the records with those of previous years we find the amount of rainfall (42·49 inches) is above the average compared with 39·75 inches in 1906, which was also over the average. Curiously, despite appearances to the contrary, the average monthly rainfall was normal in the aggregate up to the end of September. The heavy rainfall of October and December, however, made up the difference. The driest month of the year was September, with a rainfall of 1·24 inches and 18 dry days. The driest month during 1906 was April, with only 1·21 inches of rain and 19 dry days. The wettest month was October, with a rainfall of 6·67 inches and only 4 dry days. In 1906 October was also the wettest month, with 5·33 inches and 5 dry days, though August had nearly the same amount, with 5·28 inches.

The greatest amount registered for twenty-four hours was 2·27 inches at 9 a.m. on the 16th October, which was a very abnormal quantity; while on the 7th of the same month 1·01 inches were registered, and on the 17th March, 1·05 inches. Only on one occasion in 1906 was the inch exceeded, and, strangely, that was on the 17th March, when the amount was 1·08 inches.

There were 147 dry days against 152 in the previous year.

The following table of rainfall recorded in those parks where gauges are placed is of interest as showing the variations in the different parts of the city. Due allowance must always be made for local conditions, as the exposure, altitude, and surroundings are different in each case:—

RAINFALL DURING 1907 IN THE PUBLIC PARKS.

	Queen's.	Max-well.	Kelvin-grove.	Spring-burn.	Alex-andra.	Glasgow Green.	Bella-houston.	Toll-cross.	Ruchill.	Botanic Gardens.	George Square.
Height of Gauge above Sea-level.	145 ft.	69 ft.	48 ft.	361 ft.	141 ft.	34 ft.	160 ft.	85 ft.	220 ft.	110 ft.	40 ft.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
January, -	2·12	1·79	2·52	3·02	2·54	2·94	2·05	2·71	2·86	2·23	2·27
February, -	2·68	1·95	3·01	2·59	2·89	3·51	2·04	3·08	2·57	2·30	2·16
March. - -	3·94	3·67	4·03	4·48	3·92	4·27	3·78	3·53	4·14	3·47	3·86
April, - -	2·30	1·93	1·73	1·02	1·51	1·75	1·72	1·90	1·53	1·30	1·14
May, - - -	3·63	3·12	3·49	3·22	3·42	3·60	3·57	4·04	3·80	3·40	3·23
June, - - -	3·99	4·12	3·97	4·32	4·42	4·35	4·05	4·34	4·33	3·96	3·98
July, - - -	3·38	3·21	3·26	3·00	2·75	3·40	3·00	3·06	2·55	3·32	3·33
August. - -	4·65	5·16	4·54	5·39	4·33	4·94	4·39	5·73	5·68	4·91	4·38
September, -	1·24	1·50	1·30	1·00	1·54	1·42	1·23	1·43	1·45	1·27	1·32
October, - -	6·67	6·71	6·63	5·67	6·69	6·99	6·31	6·85	6·66	6·48	5·89
November, -	2·31	2·39	2·07	1·80	2·17	2·30	2·07	1·93	2·41	2·11	2·23
December, -	5·58	5·67	4·99	4·17	4·99	5·24	4·91	5·37	5·82	4·32	5·01
Totals, -	42·49	41·22	41·54	39·68	41·17	44·71	39·12	43·97	43·80	39·07	38·80

In regard to the temperature, for the third year in succession the monthly averages have been high on the whole, and the mean temperature is similar. Again we have to note the absence of severe frosts. Though the thermometer in shade was at or below freezing point (32° Fahr.) on 52 days, actual frost was registered only on 40 occasions, totalling 195°, as compared with 287° on 57 days in 1906. After 18th April, when 2° were registered, no frost was registered until 15th October—a somewhat unusual occurrence for the district to escape frosts in May and early in September. There was only one occasion during the year when the thermometer did not rise above freezing point in the twenty-four hours, this being noted on 24th March. The greatest amount of frost for one day was 18° on 24th January. The highest reading was on 18th July, when the thermometer in shade reached 78°. While the months of July, August, and September show the highest averages, the day or maximum was in each month lower than the corresponding months in 1906.

The following table regarding temperature may prove of interest for comparison:—

1907.	Queen's Park.	Maxwell Park.	Kelvingrove Park.	Springburn Park.	Alexandra Park.
Thermometer (in shade 4 feet above ground level.)					
Highest reading of year,	78° on 18th July	84° on 18th July	88° on 17th July	83° on 18th July	84° on 18th July
Lowest do.,	18° on 24th January	11° on 24th January	16° on 24th January	15° on 1st February	15° on 24th January
Number of days on which thermometer fell to freezing point (32°),	51 days	62 days	98 days	74 days	79 days
Number of days on which thermometer did not rise above freezing point (32°), ...	1 day	3 days	3 days	None	3 days
Degrees of Frost registered—					
January, ...	55° on 10 days	111° on 14 days	99° on 16 days	96° on 14 days	65° on 10 days
February,	76 " 12 "	113 " 15 "	136 " 20 "	112 " 19 "	112 " 17 "
March, ...	15 " 5 "	17 " 6 "	51 " 11 "	18 " 8 "	24 " 6 "
April, ...	2 " 1 day	6 " 2 "	28 " 10 "	20 " 6 "	16 " 6 "
May, ...	...	...	1 " 1 day	...	...
June, ...	...	...	...	...	...
July, ...	...	...	...	...	...
August, ...	...	...	...	...	...
September,	...	...	2° on 1 day	...	1° on 1 day
October, ...	...	5° on 2 days	3 " 1 "	2° on 1 day	5 " 3 days
November,	28° on 7 days	57 " 10 "	68 " 14 days	20 " 6 days	43 " 9 "
December,	19 " 5 "	27 " 6 "	16 " 6 "	28 " 13 "	33 " 7 "
Total frost registered, ...	195° on 40 days	336° on 55 days	404° on 80 days	296° on 67 days	299° on 59 days

Glasgow Green.	Bellahouston Park.	Tollcross Park.	Ruchill Park.	Botanic Gardens.	George Square.
86° on 18th July	87° on 18th July	84° on 17th July	89° on 17th July	87° on 18th July	81° on 18th July
18° on 24th January	14° on 24th January	12° on 6th February	12° on 25th January	18° on 24th January	19° on 24th January
40 days	90 days	65 days	71 days	80 days	48 days
1 day	None	1 day	None	3 days	None
54° on 9 days	96° on 13 days	69° on 10 days	108° on 12 days	69° on 15 days	49° on 8 days
68 " 10 "	140 " 18 "	107 " 15 "	123 " 16 "	92 " 15 "	64 " 10 "
4 " 3 "	44 " 10 "	16 " 6 "	27 " 8 "	24 " 7 "	14 " 5 "
...	10 " 6 "	6 " 3 "	12 " 4 "	4 " 1 day	1 " 1 day
...	...	...	1 " 1 day	...	...
...	...	...	...	...	...
...	...	...	...	..	...
...	...	..	...	...	...
...	...	...	1° on 1 day	1° on 1 day	...
...	4° on 3 days	1° on 1 day	2 " 2 days	2 " 1 "	...
17° on 6 days	42 " 8 "	35 " 8 days	26 " 6 "	37 " 9 days	16° on 6 days
14 " 4 "	51 " 13 "	23 " 5 "	20 " 7 "	25 " 9 "	18 " 7 "
157° on 32 days	387° on 71 days	257° on 48 days	320° on 57 days	254° on 58 days	162° on 37 days

In regard to the atmospheric pressure, the range was wider and the readings more varied than those of previous year. The two extremes were 30·75 inches on 23rd January and 28·40 inches on 20th February, or a range of 2·35 inches. In 1906 the range was exactly 2 inches, the highest reading being 30·50 on 22nd January and the lowest 28·50 inches on 13th February.

In regard to the winds, there was a greater preponderance than usual from an easterly direction. Grouping them in two divisions, the western is credited with 245 days and the eastern with 120 days. In 1905 and 1906 the eastern had only 81 and 80 days respectively.

Summarising the weather conditions for the year, the outstanding features are the absence of severe frosts, an abnormal rainfall in the latter part of the year, and an unusual prevalence of easterly winds. Unfortunately, not having any sunshine recorders in our parks, we are unable to tabulate the number of hours the sun shone during the season. There is no doubt whatever that the comparative absence of sunshine was a most notable feature of the weather of 1907. This want of sunshine was very evident on vegetation in the spring and early summer months. Growth was slower than usual, and from 10 to 20 days later. The flowering of most trees and shrubs was of an unusually erratic and of a meagre description in many cases, though as the season advanced the development of shoots and foliage was satisfactory enough. Still the absence of sun heat is evident, as there is a decided lack of flower-buds on the majority of trees and shrubs, and the promise of a display of bloom in garden, orchard, and woodland is poor indeed. Rarely have farmers had such a trying season. While cereals were sown under fairly satisfactory conditions and the growth steady and good, the want of dry, sunny weather retarded the ripening. This resulted in a late harvesting, further aggravated by the heavy rains during October, which caused serious delay and much damage to the grain. In many districts, while the grain crops were above the average, the inability to get them secured discounted the gain, and the autumn of 1907 will long be remembered by agriculturists. Root crops likewise suffered from the same causes, but of the two leading crops turnips suffered most. There was the initial difficulty in getting the seed sown, on account of the wet condition of the ground, especially on clay soils. The after-growth was slow and unsatisfactory. Seldom indeed have turnip crops

been seen in such a state, and in many districts the amount of "shot" or "bolted" turnips in the fields was phenomenal. Potatoes, having been planted under more satisfactory conditions, did better, but, owing to the want of heat, were generally below the average also. Despite the difficulty in getting it secured, the hay crop proved, on the whole, a satisfactory one.

We can only express the hope that better conditions will prevail during the coming season.

Subjoined is the abstract of the record for the past three years as kept at Queen's Park.

JAS. WHITTON,
Superintendent of Parks.

City Chambers,
Glasgow, *February*, 1908.

COPY OF METEOROLOGICAL RECORD KEPT AT QUEEN'S PARK, GLASGOW.

Rain Gauge 145 Feet above Sea Level.

MONTHS.	1905.				1906.				1907.				Averages for the Last 12 Years.					
	Rainfall.	Thermometer. Average.		Dry Days.	Rainfall.	Thermometer. Average.		Dry Days.	Rainfall.	Thermometer. Average.		Dry Days.	Years.	Rainfall.	Mean Temperature.	Dry Days.	Number of Days on which 1° or more of Frost was registered.	Degrees of Frost registered.
	Inches.	Max.	Min.		Inches.	Max.	Min.		Inches.	Max.	Min.			Inches.				
January,	1·78	43	35	15	4·74	43	37	8	2·12	43	35	13	1896	33·90	47	209	63	331
February,	2·51	45	34	11	2·83	42	30	10	2·68	41	32	15	1897	40·22	46	205	61	347
March, ...	3·16	49	37	6	3·37	45	33	21	3·94	49	37	15	1898	38·44	48	212	42	190
April, ...	1·79	51	36	15	1·21	54	35	19	2·30	52	39	18	1899	41·67	47	193	64	415
May, ...	1·67	58	44	17	3·84	54	42	7	3·63	53	43	13	1900	46·46	47	164	57	326
June, ...	0·82	64	50	22	1·69	65	50	17	3·99	57	47	6	1901	34·65	47	201	70	327
July, ...	2·81	67	53	12	2·37	64	50	9	3·38	63	50	15	1902	30·82	45	185	53	392
August,...	3·61	62	50	12	5·28	64	53	8	4·65	60	49	7	1903	55·52	45	138	48	286
September,	2·11	58	46	12	1·41	62	47	21	1·24	60	48	18	1904	34·87	46	163	58	246
October,	2·57	50	36	18	5·33	55	43	5	6·67	52	43	4	1905	29·62	47	160	55	226
November,	3·29	44	35	10	4·17	49	41	12	2·31	48	38	12	1906	39·75	47	152	57	287
December,	3·50	45	39	10	3·51	42	33	15	5·58	44	36	11	1907	42·49	47	147	40	195
	29·62			160	39·75			152	42·49			147	Averages,	39·03	47°	177	56	295°

Notes on the Birds frequenting Elder Park, Govan.

By William Rennie.

[Read 28th April, 1908.]

In bringing before the Society some notes on the birds frequenting the Elder Park, Govan, from March, 1906, to March, 1908, I do not profess either to give a complete list, or to indicate the actual dates of appearance or disappearance of the various species, as the time at my disposal for observation has been very short.

Elder Park, which is situated on the Lands of Fairfield, at the west end of the burgh of Govan, was the gift of Mrs. John Elder, and was opened on 25th June, 1885. It has an area of 37 acres. The frontage to the Renfrew Road is 1,550 feet, and the width from north to south is 800 feet on the east side, and about 1,200 feet on the west.

The trees are quite similar in character to those usually met with in such places. Most of the higher trees are situated on the boundary, and are principally Elms, Poplars, and Willows, with an occasional Beech. The avenues are formed of Willows and some Poplars. The shrubs consist mainly of Elder, Privet, Lilac, Laurel, and Rhododendron. Scattered throughout the park are Hawthorn, Beam, Laburnum, Holly, and some fruit-trees. These last have not borne fruit during the period included in my observations, though they have blossomed freely.

The south-west corner of the park is pleasantly situated and quiet, with very little traffic passing through it. This is the place where most of the rarer visitors are to be seen, and to it the greater part of my time was devoted.

As regards the supply of food for birds, the winter of 1906 presented a striking contrast when compared with that of 1907. In 1906 the Beam-trees and Hawthorns were covered with their red berries, and the Hollies gave a good display. In 1907, however, there was no blossom on the Beam-trees, and consequently no berries; and although there was a fair display of Hawthorn-bloom in the spring, haws were very scarce, while the Hollies were practically without berries.

There was therefore in 1906 a plentiful supply of food for the birds, while in 1907 they had almost none. Along with that fact, we have also to take into consideration the climatic conditions which prevailed during the winter season. The weather in 1906 was more severe than in 1907, and was notable for keen frosts and severe snowstorms, as compared with the continuous rains and open boisterous weather which prevailed during the latter season. Last winter the Missel Thrush, Redwing, and Fieldfare merely put in an appearance and went elsewhere, owing to the mildness and openness of the weather and the scarcity of food.

At different times, through stress of weather, many birds were driven into the park for food and shelter. This enabled me to add to the list a few which otherwise might never have been noted.

Missel Thrush *(Turdus viscivorus)*.—About the middle of November, 1906, during keen frost, a flock of about a dozen Missel Thrushes visited the park, but they began to dwindle off as the weather became more open. The Missel Thrush could be seen daily up till the breeding season. By the end of March, 1907, all had left, and they did not make a reappearance till 13th September. An occasional bird was seen during the next few weeks, when they again left the park. A pair made a reappearance on 11th January, 1908. Since then they have been seen almost daily. On 25th March a second pair were seen about the south end.

Song Thrush *(Turdus musicus)*.—Common all the year round. This year the Song Thrush started to sing as early as 23rd January, probably owing to the mildness of the weather. In April, 1907, I watched a pair of birds carrying building material, but was unable to locate the site of the nest. After a while the birds were seen carrying food for their young ones; and on 6th May a pretty sight could be observed near the gardener's house, as the old birds were then teaching their four young ones to fare for themselves. During the first week in December, 1907, the weather was very stormy, and a large number of Song Thrushes came into the park for a few days.

Redwing *(Turdus iliacus)*.—A winter migrant. I observed the Redwing for the first time about the end of October, 1906. At no time was it common, and it was usually seen in company with the Song Thrush. After careful watching, I noticed that the birds got nearly all their food on the ground. The Hawthorn was the only tree of which I saw them touch the berries. The Redwings were seen up till 8th March, 1907, and reappeared on 28th November. From that date onward no sign of them could be seen until during the stormy weather of the last week of January. On 31st January five were noted amongst the shrubs at the south-west corner of the park. These were quite tame, and one of them approached to within 6 feet from where I was standing.

Fieldfare *(Turdus pilaris)*.—Another of our winter visitors. Fieldfares were common during the winter of 1906, and arrived about the same time as the Redwings, but were more inclined to frequent the trees, and were very seldom seen on the ground. They remained very wild up till their departure on 29th March. They reappeared on 11th December, which was the only time when I saw the Fieldfare last winter.

Blackbird *(Turdus merula)*.—A resident. It starts to sing at the beginning of February. I am under the impression that a few pairs nest annually in the park, as young birds are common during summer. About the middle of April, 1907, I had daily the pleasure of watching a pair of Blackbirds during their love-making. They seemed to prefer one tree in particular, on which they afterwards built their nest. The nest, which took about a fortnight to build, was unfortunately placed in an exposed position, and was damaged twice before completion. Having taken my stand about twelve feet from the nest, I could watch, through the shelter of a shrub, the building operations. The female bird sat inside and laboured at the construction of the nest, while the male bird supplied her with the materials. She kept beating her breast against the inside of the nest, so as to give it its rounded shape, while she adjusted the outside with her bill. On 10th May, a day or two after the nest had been completed, I found that the whole structure had been torn down. The birds then gave

up the attempt to build. About the same time another pair started building operations. After a few days' labour had been expended upon it, the nest, which was likewise in an exposed position, was also destroyed.

Wheatear *(Saxicola œnanthe)*.—The Wheatear may be considered one of the rarer summer visitors to the park, as I have only been able to see it on two occasions, viz., in June, 1906, and again in July, 1907.

Robin *(Erithacus rubecula)*.—The Robin is one of our common residents, and begins to sing when the mornings become frosty (28th August, 1907), continuing till well on in spring. Up to the present time I am not certain of its nesting within the park, although I have seen Robins about the rubbish-heap with what appeared to be materials for building.

Golden-crested Wren *(Regulus cristatus)*.—On 24th February, 1908, after a wild week-end, this interesting bird made its appearance at the south-west corner of the park. It is not only the smallest bird in this country, but also the most diminutive species in Europe. I was sorry that I had not more time to follow its restless movements amongst the trees, as it searched for insects, &c., and uttered its usual cheery notes.

Willow Wren *(Phylloscopus trochilus)*.—The Willow Wren is a regular summer visitor to the park, and arrives about the beginning of May. A most persistent songster, its loud clear notes are heard throughout summer. It prefers to sing during the heat of the day, when other birds are quiet. The Willow Wren arrived on 15th May, 1907, and occurred very plentifully during the season. On 15th August as many as a dozen birds could be seen together near Mrs. Elder's statue. Nothing more was seen of them till 21st August, when a pair appeared. This was their last occurrence for the season.

Hedge-Sparrow *(Accentor modularis)*.—The Hedge-Sparrow is one of the resident species. At no time, however, can it be said to be common. It is seldom seen during summer.

During 1907 I noticed a Hedge-Sparrow on different days with food (worms and insects), evidently for feeding its young ones, but I was unable to find the nest. I had suspected it to be located in one of the small clumps of trees; and accordingly, at the end of the year, when the trees were bare, a nest could be seen in a small Hawthorn, surrounded by Laurel and other shrubs which completely hid it from view. On examining the nest, I was fully convinced that it had been built by the Hedge-Sparrow.

Long-tailed Titmouse *(Acredula caudata)*.—On 24th February, 1908, which was a clear day after some stormy weather, a Long-tailed Titmouse was seen feeding amongst the tall branches of the trees at the south-west corner of the park. Its mate was calling near it, but could not be distinguished owing to the sun shining directly on the trees at the time.

Great Titmouse *(Parus major)*.—Usually seen during the winter, but never more than a pair at a time. It occurs at the south or west end of the park. I have seen it about six times this year (1908).

Coal Titmouse *(Parus ater)*.—Only seen once, viz., on 22nd March, 1907, at the south-west corner.

Blue Titmouse *(Parus cæruleus)*.—Occurs all the year round. One of the most attractive sights of the park is to witness these gay-coloured little birds flying from tree to tree, and to watch their antics in searching the branches for insects and larvæ.

Wren *(Troglodytes parvulus)*.—This is one of the shyest birds that visit the park. It is interesting to watch the timid little fellow, with his short cocked-up tail, hopping about amongst the shrubs, while he utters his loud clear notes. The Wren seems only to wander in occasionally, for although I observed it at different times of the year, I have never seen or heard it on two consecutive days.

Pied Wagtail *(Motacilla lugubris)*.—The three Wagtails which occur in the park can only be called occasional visitors, and are at no time common. The Pied Wagtail is the most

frequent species, and visits the park for a few days in spring, reappearing in the month of November. During the first fortnight of November in 1906 and 1907, Pied Wagtails were to be seen daily. They probably made the park a halting-place on the line of their migration.

White Wagtail *(Motacilla alba)*.—I observed this bird on 29th April, 1907, and saw it again during the first week of May. During the spring of 1906 I had seen a Wagtail on more than one occasion, but was not quite sure as to the species. I am now satisfied, however, that it was the White Wagtail. On 30th March, 1908, during a gale from the south-west, a Wagtail was seen flying from north to south, but I was unable to determine the species. This was the first time that a Wagtail had been seen since the previous November.

Grey Wagtail *(Motacilla melanope)*.—This bird made its appearance one day during the summer of 1906, and seemed quite at home as it flitted about the edge of the pond.

Swallow *(Hirundo rustica)*.—Swallows were very scarce during the summer of 1906; but in 1907, from 21st May onward till 7th September, they were to be seen almost daily near the pond, always in groups of two or three.

House Martin *(Chelidon urbica)*.—This species was observed on a few occasions during the month of June, 1906, but I failed to see it in 1907. This, I believe, was a common experience of ornithologists last season.

Greenfinch *(Ligurinus chloris)*.—The greenfinch is common from autumn till spring, and starts to sing about the beginning of March. Sometimes small flocks of about a dozen may be seen. In 1906 and 1907 they were very plentiful at harvest time. I have not been able to find out whether the Greenfinch breeds within the grounds; but about the middle of June, 1906, a pair with three young ones were observed on two occasions.

House Sparrow *(Passer domesticus)*.—A very common resident and a prolific breeder, building its nest between the brackets of the band-stand columns, and amongst the tall trees that border the Renfrew Road.

Chaffinch *(Fringilla cœlebs)*.—The Chaffinch is to be found nearly all the year round, except during the hottest period of summer or in very cold weather. At no time, however, is it very plentiful. It begins to sing at the end of February. Last year (1907) a pair of Chaffinches built a lovely little nest in a Hawthorn. The outside was covered with the silver bark of the Birch *(Betula alba)*, of which there are many small trees within the grounds; but alas! the branch was broken off on 23rd April, the day of the Naval Volunteer Review. This is the only occasion on which I have observed the Chaffinch attempt to build its nest within the grounds.

Brambling *(Fringilla montifringilla)*.—Whilst Bramblings were being reported as common all round the city, nothing was seen of them in the park till 15th March, 1907, when, after a slight fall of snow, a pair were noted amongst the tall trees on the west side. Want of time prevented my making further search.

Linnet *(Acanthis cannabina)*.—On 12th December, 1907, a small flock of Linnets visited the south side of the park. As many as nine could be seen at once, while, on the other side of the road from the park, quite a number could be seen on the hedge. Seven were observed on the following day, after which they seem to have left the district, as the weather at that time was wet and boisterous. On 31st January, 1908, which was very stormy, a small flock of Linnets was seen at the south-west corner. As these birds were very common in Bellahouston Park at that time, they may possibly have come from there to the Elder Park. On 6th February—an ideal spring morning—a Linnet was heard pouring forth its sweet song amongst the tall trees near the gardener's house.

Lesser Redpoll *(Acanthis rufescens)*.—A pair of Redpolls were seen on 11th March, 1907, amongst the tall trees in the south-west corner.

Yellow Bunting *(Emberiza citrinella)*.—The Buntings are only occasional visitors. One Yellow Bunting was seen in the month of May, 1906, and the species was again noted three times during June and August, 1907.

Reed Bunting *(Emberiza schœniclus)*.—An occasional bird was seen during the spring and autumn of 1906 and 1907.

Starling *(Sturnus vulgaris)*. — A common resident. Although not very numerous during the summer months, as many as sixty birds have been seen together during the months of winter.

Magpie *(Pica rustica)*.—This can only be looked upon as a rare visitor. It was seen amongst the trees at the south-west corner, where one occurred on 2nd February and two on 4th February, 1907.

Jackdaw *(Corvus monedula)*.—Jackdaws were seen on two occasions during the spring of 1906, at which time these birds were not uncommon at one of the "coups" or rubbish-heaps near the river. On 17th January, 1908, a solitary Jackdaw was seen near the flagstaff.

Rook *(Corvus frugilegus)*.—These birds are common all the year round. They are to be met with all over the park, but particularly inside the deer-run, which is the place they most frequent.

Skylark *(Alauda arvensis)*.—One morning, during stormy weather in the spring of 1906, four Skylarks were seen on one of the grass lawns near the band-stand. The bird may occasionally be heard singing outside the limit of the park, but only on that one occasion have I seen it inside.

Swift *(Cypselus apus)*.—I have only seen the Swift on two occasions at the west end of the park, viz., one bird on 1st June and two on 9th August, 1907.

Sparrow-Hawk *(Accipiter nisus)*.—In the course of the severe weather in November, 1906, during the week when so many Missel Thrushes came into the park, my attention was attracted by an unusual chattering of the small birds. After a little I noticed a Sparrow-Hawk perched on one of the trees near the greenhouse, but through want of time I was unable to wait to see how its visit ended.

Lapwing *(Vanellus vulgaris)*.—A few odd birds were seen during the spring and autumn of 1906. I have no records for 1907. On 13th January, 1908, three Lapwings came in overhead, and were in the act of alighting on the south side of the park, but having been disturbed they immediately flew outwards again. On 8th February a flock of about thirty, and another of thirteen, passed over the park from south to north, flying very low. On 30th March, during a gale from the south-west, a pair of Lapwings crossed the park in a westerly direction.

Black-headed Gull *(Larus ridibundus)*.—This bird can be seen daily at the pond, except during the breeding season, when it only occurs occasionally. During the months of summer one is almost sure to see at least one pair about the pond; but in winter, especially during stormy weather, they are very common, and may be watched skimming over the pond and whirling up to a great height. On 14th November, 1907, during stormy weather, as many as a dozen could be observed at the pond.

Common Gull *(Larus canus)*.—During the summer this species may sometimes be seen on the grass patches, and is not uncommon in the fields outside the park.

Herring Gull *(Larus argentatus)*.—This is the commonest of the Gulls, and can be seen almost daily, especially during the months of winter and spring, passing and repassing across the park. Very seldom do they alight, although an occasional bird may be seen about the pond during summer. In the winter time the Gulls frequenting the pond are usually young birds in immature plumage.

Lesser Black-backed Gull *(Larus fuscus)*.—Single birds have been seen on the grass lawns a few times during summer.

To this list of forty species a few more might doubtless be added by careful observation. I have been informed by Mr. Angus M'Leod, who has also devoted some attention to Elder Park, that he has seen the Tree Creeper *(Certhia familiaris)*

and Spotted Flycatcher *(Muscicapa grisola)* within its bounds.

ADDENDUM.

Since the foregoing was written, the following summer migrant falls to be added :—

14th August, 1908. Yellow Wagtail *(Motacilla raii).*— This bird is not uncommon in the district, and nests in the vicinity.

Bryum Duvalii, Voit., in Lanarkshire.

By D. A. Boyd.

[Read 23rd June, 1908.]

So far as the south-western counties of Scotland are concerned, this moss has as yet been recorded only for Dumfries and Lanark. Its discovery in Lanarkshire was due to Mr. John R. Lee, who obtained specimens on Tinto at the Society's excursion to that mountain on 3rd June, 1905.*

On 30th May last, when visiting the Lowther range of hills, I was so fortunate as to discover another Lanarkshire station for this species. It grew on the north-eastern slope of Durisdeer Hill, in the Parish of Crawford, on boggy ground beside a spring which formed the source of a branch of the Potrail, one of the head-waters of the Clyde. It occurred in numerous patches, which were conspicuous by reason of their bright pink colour.

In colour and general habit, *B. Duvalii* bears considerable resemblance to slender and elongated forms of *B. pallens*, Sw.; from which common moss, however, it may be readily distinguished by its more conspicuously decurrent leaves, shorter nerve, and almost plane leaf-margin, bordered with two rows of narrowly elongated cells. In *B. pallens* the leaf-margin is distinctly thickened, brownish, and revolute.

Having thus been found in two localities in Lanarkshire, *B. Duvalii* may be expected to occur elsewhere throughout the Clyde area, if carefully searched for in the more hilly regions of our district.

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* *Trans. Nat. Hist. Soc., Glasgow*, Vol. VII., p. 305.

Occurrence of the Water Betony (*Scrophularia aquatica*, L.) in Islay.

By Thomas F. Gilmour, L.R.C.P.Ed.

[Read 26th October, 1907.]

Though by no means a rare plant, this species is, I think, sufficiently uncommon in the West of Scotland to be worthy of notice by the Society, especially as it seems to be quite new to Vice-County 102. In the course of my botanical rambles I have not hitherto met with it in Islay; but this year it has appeared in great plenty along the banks of the Cornabus Burn, for the last half-mile of its course, and not higher up the stream. As that is a part of the parish which I have been over many times, it is almost impossible that the plant if present could have been overlooked by me. The clumps are broad and striking, and catch the eye readily, even at a distance. As a matter of fact, I was two fields away when I first noticed them this summer, and felt sure that here there was something new. How, then, are we to account for the sudden irruption of this plant? I venture to suggest that it is a chance introduction. The farmer, through whose land the Cornabus Burn flows, came from Ayrshire, and that county appears to be the only one in the West of Scotland from which *Scrophularia aquatica* has been recorded. It may possibly, therefore, have come with grain or other material. All the plants occur on the banks of the lower part of the stream, between the farm and the sea. It is also worth noting that some years ago this burn was badly torn up by floods of a prolonged and destructive character, and it is quite certain that the plants have only appeared since then.

List of Bute Plants.

By J. Ballantyne.

[Read 30th October, 1906.]

Along with Arran, the two Cumbraes, and the small islet of Inchmarnock, Bute is included in the group of islands known in topographical botany as the "Clyde Isles," or Vice-County 100.

Owing to its well-known popularity as a health resort, Rothesay, the county town, is visited annually by thousands of persons who come in search of health and holiday enjoyment, many of whom are interested in natural history pursuits. For some reason not easily explained, there does not appear to be at present any reliable list of either the fauna or flora of the island. To meet in part this felt want, I have prepared the following list of plants, and although it is by no means exhaustive, it may help as a preliminary contribution towards a more complete catalogue in the near future.

Owing to the mild and equable climate of Bute, its variety of soils, and its numerous lochs and marshes, a large number of plants are to be found on the island, many of which are comparatively rare so far as the West of Scotland is concerned. The mildness of its climate has contributed in no small degree to a number of garden escapes and other alien plants, many of which have their home much further south, establishing themselves in various spots, and becoming quite naturalised. Among these may be mentioned *Claytonia sibirica*, Linn.; *Ribes Grossularia*, Linn.; *Peucedanum Ostruthium*, Koch; *Anthemis nobilis*, Linn.; *Linaria Cymbalaria*, Mill.; *Linaria repens*, Mill.; and *Mimulus luteus*, Linn. Others, again, such as *Papaver Argemone*, Linn.; *Meconopsis cambrica*, Vig.; *Chelidonium majus*, Linn.; *Iberis amara*, Linn.; *Fœniculum vulgare*, Mill.; *Scabiosa arvensis*, Linn.; *Hieracium aurantiacum*, Linn.; *Vinca major*, Linn.; *Polemonium cæruleum*, Linn.; and *Plantago media*, Linn., can only be considered as casuals, and have either been introduced with farm-seeds or have recently escaped from cultivation. Although all these are found occasionally in the island, they have apparently failed to find a congenial home in the soil of Bute, and cannot be said to have established themselves in any part of it.

I have been careful to enter no plant in this list unless I either have a specimen of it, or know where it is to be found in the island. For this reason, a number of fairly common plants do not appear in the list; but it is better that they should meanwhile be omitted than that any doubt should be raised regarding them.

No attempt has been made in the meantime to deal with the

many forms of roses, brambles, hawkweeds, willows, and other critical genera, although these appear to be well represented throughout the island. The species of *Carex* noted are those only which have been examined by Mr. A. Somerville, B.Sc., F.L.S. There are a number of others which are not included, owing to the doubtful character of the specimens in my possession, and I have not been able as yet to obtain others suitable for identification. Mr. Somerville also very kindly had a number of my specimens submitted to Mr. A. Bennett, F.L.S., for confirmation.

Callitriche autumnalis, Linn., was found and identified by the Rev. E. S. Marshall when on a visit to Bute a few years ago, and when I had the pleasure of taking him to some of the favourite haunts of plants.

I am also indebted to Mr. Robert D. Whyte, Town Clerk, Rothesay, and a member of the Bute Physical and Natural History Society, for information regarding a number of plants which he has found. He is preparing a collection of Bute plants for the Rothesay Museum, which is being reorganised by the Buteshire Natural History Society, so that all who are interested in the plants of the district may be able to obtain at the museum any information desired regarding them.

The Island of Bute is divided into three parishes, viz., (1) North Bute, (2) Rothesay, and (3) Kingarth; and reference to these parochial divisions affords a convenient method of indicating the local distribution and comparative frequency or rarity of each species. The respective parishes in which each plant has been found are indicated by the numerals appended to the specific name, and these correspond to the above enumeration of the parochial divisions of the island.

Anemone nemorosa, Linn. 1, 2, 3.
Ranunculus trichophyllus, Chaix. 3.
R. peltatus, Schrank. 2.
R. hederaceus, Linn. 1, 2, 3.
R. Flammula, Linn. 1, 2, 3.
R. acris, Linn. 1, 2, 3.
R. repens, Linn. 1, 2, 3.
R. bulbosus, Linn. 1, 2, 3.
R. Ficaria, Linn. 1, 2, 3.
b. incumbens, F. Schultz. 1, 2, 3.
Caltha palustris, Linn. 1, 2, 3.
Trollius europæus, Linn. 1.
Berberis vulgaris, Linn. 2.
Nymphæa lutea, Linn. 2.
Castalia speciosa, Salisb. 1, 2.
b. minor, D.C. 2.
Papaver Argemone, Linn. 3.
Meconopsis cambrica, Vig. 2, 3.
Glaucium flavum, Crantz. 3.
Chelidonium majus, Linn. 2, 3.
Neckeria claviculata, N.E.Br. 3.
Fumaria officinalis, Linn. 1, 2, 3.

Nasturtium officinale, R. Br. 1, 2, 3.
Arabis hirsuta, Scop. 2.
Cardamine pratensis, Linn. 1, 2, 3.
C. hirsuta, Linn. 1, 2, 3.
C. flexuosa, With. 1, 2, 3.
Erophila vulgaris, D.C. 3.
Cochlearia officinalis, Linn. 1, 2, 3.
Sisymbrium Thalianum, J. Gay. 1, 2, 3.
S. officinale, Scop. 1, 2, 3.
Brassica Rapa, Linn. 1, 2, 3.
B. monensis, Huds. 3.
B. Sinapistrum, Boiss. 1, 2, 3.
Bursa Bursa-pastoris, Weber. 1, 2, 3.
Lepidium hirtum, Sm. 3.
Iberis amara, Linn. 3.
Cakile maritima, Scop. 3.
Raphanus Raphanistrum, Linn. 3.
R. maritimus, Sm. 3.
Viola palustris, Linn. 1, 2, 3.
V. Riviniana, Reich. 1, 2, 3.
V. tricolor, Linn. 1, 2, 3.
V. arvensis, Murr. 1, 2, 3.
V. Curtisii, Forster. 1, 2, 3.
Polygala vulgaris, Linn. 1, 2, 3.
Silene maritima, With. 1, 2, 3.
Lychnis alba, Mill. 2.
L. dioica, Linn. 1, 2, 3.
L. Flos-cuculi, Linn. 1, 2, 3.
Cerastium tetrandrum, Curtis. 3.
C. glomeratum, Thuill. 1, 2, 3.
C. triviale, Link. 1, 2, 3.
Stellaria media, Cyr. 1, 2, 3
S. Holostea, Linn. 1, 2, 3.
S. graminea, Linn. 1, 2, 3.
S. uliginosa, Murr. 1, 2, 3.
Arenaria trinervia, Linn. 2.
A. serpyllifolia, Linn. 1, 2, 3.
A. peploides, Linn. 1, 2, 3.
Sagina procumbens, Linn. 1, 2, 3.
S. nodosa, Fenzl. 1, 2, 3.
Spergula arvensis, Linn. 1, 2, 3.
Buda rubra, Dum. 1, 2, 3.
B. media, Dum. 1.
Claytonia sibirica, Linn. 2, 3.
Montia fontana, Linn. 1, 2, 3.
Hypericum Androsæmum, Linn. 1.
H. dubium, Leers. 1, 2, 3.
H. quadratum, Stokes. 1, 2, 3.
H. pulchrum, Linn. 1, 2, 3.
H. elodes, Linn. 2, 3.
Malva sylvestris, Linn. 3.
Tilia vulgaris, Hayne. 1, 2, 3.
Radiola linoides, Roth. 2, 3.
Linum catharticum, Linn. 1, 2, 3.
Geranium sanguineum, Linn. 3.
G. pratense, Linn. 1.
G. molle, Linn. 1, 2, 3.
G. dissectum, Linn. 1, 2, 3.
G. Robertianum, Linn. 1, 2, 3.
Erodium cicutarium, L'Herit. 3.
Oxalis Acetosella, Linn. 1, 2, 3.
Ilex Aquifolium, Linn. 1, 2, 3.
Acer Pseudo-platanus, Linn. 1, 2, 3.
Ulex europæus, Linn. 1, 2, 3.
Cytisus scoparius, Link. 1, 2, 3.
Ononis repens, Linn. 3.
Medicago lupulina, Linn. 1, 2, 3.
Trifolium pratense, Linn. 1, 2, 3.
T. medium, Linn. 1, 2, 3.
T. procumbens, Linn. 1, 2, 3.
T. repens, Linn. 1, 2, 3.
Anthyllis Vulneraria, Linn. 3.
Lotus corniculatus, Linn. 1, 2, 3.
L. uliginosus, Schkuhr. 1, 2, 3.
Vicia Cracca, Linn. 1, 2, 3.
V. sepium, Linn. 1, 2, 3.
V. sativa, Linn. 1, 2, 3.
V. angustifolia, Linn. 3.
Lathyrus pratensis, Linn. 1, 2, 3.
Prunus spinosa, Linn. 3.
P. Padus, Linn. 3.

Spiræa Ulmaria, Linn. 1, 2, 3.
Rubus Idæus, Linn. 1, 2, 3.
R. fruticosus, Linn. 1, 2, 3.
Geum urbanum, Linn. 1, 2, 3.
G. rivale, Linn. 1, 2, 3.
Fragaria vesca, Linn. 3.
Potentilla Fragariastrum, Ehrh. 1, 2, 3.
P. silvestris, Neck. 1, 2, 3.
P. Anserina, Linn. 1, 2, 3.
P. palustris, Scop. 1, 2, 3.

Alchemilla arvensis, Scop. 1, 2, 3.
A. vulgaris, Linn. 1, 2, 3.
Agrimonia Eupatoria, Linn. 3.
Rosa pimpinellifolia, Linn. 3.
R. mollis, Sm. 2.
R. rubiginosa, Linn. 2.
R. canina, Linn. 2.
a. lutetiana, Leman. 2.
Pyrus Aucuparia, Ehrh. 1, 2, 3.
Cratægus Oxyacantha, Linn. 1, 2, 3.
Saxifraga aizoides, Linn. 1, 2.
Chrysosplenium oppositifolium, Linn. 1, 2, 3.
Parnassia palustris, Linn. 1, 2, 3.
Ribes Grossularia, Linn. 1.
Cotyledon Umbilicus, Linn. 3.
Sedum Rhodiola, D.C. 3.
S. Telephium, Linn. 2.
S. anglicum, Huds. 1, 2, 3.
S. acre, Linn. 1, 3.
Drosera rotundifolia, Linn. 1, 2, 3.
Hippuris vulgaris, Linn. 2.
Myriophyllum alterniflorum, D.C. 2, 3.
Callitriche stagnalis, Scop. 1, 2, 3.
S. autumnalis, Linn. 2.
Peplis Portula, Linn. 2.
Lythrum Salicaria, Linn. 2, 3.
Epilobium hirsutum, Linn. 2, 3.
E. parviflorum, Schreb. 1, 2, 3.
E. montanum, Linn. 1, 2, 3.
E. palustre, Linn. 1, 2, 3.
Circæa lutetiana, Linn. 2.
Hydrocotyle vulgaris, Linn. 1, 2, 3.
Eryngium maritimum, Linn. 3.
Sanicula europæa, Linn. 2.
Conium maculatum, Linn. 3.
Apium inundatum, Reichb. fil. 2, 3.
Ægopodium Podagraria, Linn. 1,2,3.
Pimpinella Saxifraga, Linn. 3.
Conopodium denudatum, Koch. 1, 2, 3.
Myrrhis odorata, Scop. 1, 2.
Chærophyllum temulum, Linn. 1,2,3.
Anthriscus sylvestris, Hoffm. 1, 2, 3.
Fœniculum vulgare, Mill. 1.
Œnanthe Lachenalii, C. Gmel. 3.
Œ. crocata, Linn. 1, 2, 3.
Ligusticum scoticum, Linn. 1.
Angelica sylvestris, Linn. 1, 2, 3.
Peucedanum Ostruthium, Koch. 2.
Heracleum Sphondylium, Linn. 1, 2, 3.
Daucus Carota, Linn. 1, 2, 3.
Caucalis Anthriscus, Huds. 1, 2, 3.
Hedera Helix, Linn. 1, 2, 3.
Adoxa Moschatellina, Linn. 1, 2, 3.
Sambucus nigra, Linn. 1, 2, 3.
Lonicera Periclymenum, Linn. 1, 2, 3.
Galium verum, Linn. 2, 3.
G. saxatile, Linn. 1, 2, 3.
G. palustre, Linn.
c. Witheringii, Sm. 1, 2, 3.
G. uliginosum, Linn. 1, 2, 3.
G. Aparine, Linn. 1, 2, 3.
Asperula odorata, Linn. 2.
Sherardia arvensis, Linn. 1, 2.
Valeriana Mikanii, Syme. 2, 3.
Valerianella olitoria, Poll. 3.
Scabiosa succisa, Linn. 1, 2, 3.
S. arvensis, Linn. 2
Eupatorium cannabinum, Linn. 3.
Solidago Virgaurea, Linn. 1, 2, 3.
Bellis perennis, Linn. 1, 2, 3.
Aster Tripolium, Linn. 1, 2, 3.
Filago germanica, Linn. 3.
F. minima, Fr. 3.
Antennaria dioica, R. Br. 1, 2, 3.
Gnaphalium uliginosum, Linn. 1,2,3.
G. sylvaticum, Linn. 1, 2, 3.
Bidens tripartita, Linn. 1, 2.
Achillea Millefolium, Linn. 1, 2, 3.
A. Ptarmica, Linn. 1, 2, 3.
Anthemis nobilis, Linn. 2.
Chrysanthemum segetum, Linn. 1, 2, 3.
C. Leucanthemum, Linn. 1, 2, 3.
Matricaria inodora, Linn. 1, 2, 3.
Artemisia vulgaris, Linn. 1, 3.
Tussilago Farfara, Linn. 1, 2, 3.
Petasites officinalis, Mœnch. 1, 3.
Senecio vulgaris, Linn. 1, 2, 3.
S. sylvaticus, Linn. 3.
S. Jacobæa, Linn. 1, 2, 3.

S. aquaticus, Huds. 1, 2, 3.
Arctium minus, Bernh. 1, 2, 3.
Cnicus lanceolatus, Willd. 1, 2, 3.
C. palustris, Willd. 1, 2, 3.
C. arvensis, Hoffm. 1. 2. 2.
Centaurea nigra, Linn. 1, 2, 3.
Lapsana communis, Linn. 1, 2, 3.
Crepis virens, Linn. 1, 2, 3.
C. paludosa, Mœnch. 1, 2, 3.
Hieracium Pilosella, Linn. 1, 2, 3.
H. aurantiacum, Linn. 2.
H. vulgatum, Fr. 1, 2, 3.
Hypochœris radicata, Linn. 1, 2, 3.
Leontodon autumnalis, Linn. 1, 2, 3.
Taraxacum officinale, Web. 1, 2, 3.
Sonchus oleraceus, Linn. 1, 2, 3.
S. arvensis, Linn. 1, 2, 3.
Tragopogon pratense, Linn. 3.
Lobelia Dortmanna, Linn. 1, 2.
Jasione montana, Linn. 1, 2, 3.
Campanula rotundifolia, Linn 1,2,3.
Vaccinium Myrtillus, Linn. 1. 2.
Calluna Erica, D C. 1, 2, 3.
Erica Tetralix, Linn. 1, 2, 3.
E. cinerea, Linn. 1, 2, 3.
Armeria maritima, Willd. 1, 2, 3.
Primula acaulis, Linn. 1, 2, 3.
Lysimachia nemorum, Linn. 1, 2, 3.
Glaux maritima, Linn. 1, 2, 3.
Anagallis arvensis, Linn. 3.
A. tenella, Linn. 1, 2, 3.
Centunculus minimus, Linn. 2.
Samolus Valerandi, Linn. 1, 2, 3.
Fraxinus excelsior, Linn. 1, 2, 3.
Ligustrum vulgare, Linn. 1, 2, 3.
Vinca major, Linn. 3.
Erythræa Centaurium, Pers. 1, 2, 3.
Gentiana campestris, Linn. 1.
Menyanthes trifoliata, Linn. 2.
Polemonium cæruleum, Linn. 3.
Symphytum officinale, Linn. 2.
S. tuberosum, Linn. 2.
Borago officinalis, Linn. 2, 3.
Anchusa sempervirens, Linn. 2, 3.
Lycopsis arvensis, Linn. 2, 3.
Pneumaria maritima, Hill. 3.
Myosotis cæspitosa, F. Schultz. 1, 2, 3.
M. palustris, Relh. 2.
M. repens, G. Don. 1, 2, 3.
M. arvensis, Lam. 1, 2, 3.
M. versicolor, Reichb. 1, 2, 3.
Volvulus sepium, Junger. 1.
Solanum Dulcamara, Linn. 2, 3.
Atropa Belladonna, Linn. 3.
Verbascum Thapsus, Linn. 3.
Linaria Cymbalaria, Mill. 1, 2, 3.
L. repens, Mill. 2, 3.
L. vulgaris, Mill. 3.
Scrophularia nodosa, Linn. 2, 3.
Mimulus luteus, Linn. 2, 3.
Digitalis purpurea, Linn. 1, 2, 3.
Veronica hederæfolia, Linn. 1, 2, 3.
V. agrestis, Linn.
V. arvensis, Linn. 1, 2, 3.
V. serpyllifolia, Linn. 1, 2, 3,
V. officinalis, Linn. 1, 2, 3.
V. Chamædrys, Linn. 1, 2, 3.
V. scutellata, Linn. 2.
V. Anagallis-aquatica, Linn. 3.
V. Beccabunga, Linn. 1. 2, 3.
Euphrasia officinalis, Linn. 1, 2, 3.
Bartsia Odontites, Huds. 1, 2, 3.
a. verna (Reichs). 1, 2, 3.
B. viscosa, Linn. 2.
Pedicularis palustris, Linn. 1, 2, 3.
P. sylvatica, Linn. 1, 2, 3.
Rhinanthus Crista-galli, Linn. 1,2,3.
Melampyrum pratense, Linn. 2.
Utricularia vulgaris, Linn. 2.
Pinguicula vulgaris, Linn. 1, 2, 3.
P. lusitanica Linn. 1, 2, 3.
Mentha hirsuta, Huds. 1, 2, 3.
M. sativa, Linn. 1, 2, 3.
M. arvensis, Linn. 1, 2, 3.
Lycopus europæus, Linn. 2. 3.
Origanum vulgare, Linn. 3.
Thymus Serpyllum, Fr. 1, 2, 3.
Nepeta Glechoma, Benth. 1, 2, 3.
Scutellaria galericulata, Linn. 1,2,3.
S. minor, Huds. 2.
Prunella vulgaris, Linn. 1, 2, 3.
Stachys palustris, Linn. 1, 2, 3.
S. sylvatica, Linn. 1, 2, 3.
S. arvensis, Linn. 3.
Galeopsis versicolor, Curt. 1, 2, 3.
G. Tetrahit, Linn. 1, 2, 3.
Lamium amplexicaule, Linn. 1, 2, 3.

L. purpureum, Linn. 1, 2, 3.
Teucrium Scorodonia, Linn. 1, 2, 3.
Ajuga reptans, Linn. 1, 2, 3.
Plantago major, Linn. 1, 2, 3.
P. media, Linn. 3.
P. lanceolata, Linn. 1, 2, 3.
P. maritima, Linn. 1, 2, 3.
P. Coronopus, Linn. 1, 2, 3.
Littorella juncea, Berg. 2
Scleranthus annuus, Linn. 2.
Chenopodium album, Linn. 2, 3.
Atriplex patula, Linn. 1, 2, 3.
A. Babingtonii, Woods. 3.
A. laciniata, Linn. 1, 2, 3.
Salicornia herbacea, Linn. 1.
Suæda maritima, Dum. 2.
Salsola Kali, Linn. 3.
Polygonum Convolvulus, Linn. 1, 2, 3.
P. aviculare, Linn. 1, 2, 3.
P. Raii, Bab. 3.
P. Hydropiper, Linn. 1, 2, 3.
P. Persicaria, Linn. 1, 2, 3.
P. lapathifolium, Linn. 1, 2, 3.
P. amphibium, Linn. 2.
b. terrestre, Leers. 2.
P. Bistorta, Linn. 1.
Rumex conglomeratus, Murr. 1.
R. sanguineus, Linn. 3.
b. viridis, Sibth. 3.
R. obtusifolius, Linn. 1, 2, 3.
R. crispus, Linn. 1, 2, 3.
R. Acetosa, Linn. 1, 2, 3.
R. Acetosella. Linn. 1, 2, 3.
Hippophae rhamnoides, Linn. 3.
Euphorbia Helioscopia, Linn. 1, 2, 3.
E. Peplus, Linn. 1, 2, 3.
Mercurialis perennis, Linn. 1, 2, 3.
Ulmus montana, Stokes. 1, 2, 3.
Urtica dioica, Linn. 1, 2, 3.
U. urens, Linn. 3.
Myrica Gale, Linn. 1, 2, 3.
Betula verrucosa, Ehrh. 1, 2, 3.
Alnus glutinosa, Medic. 2, 3.
Corylus Avellana, Linn. 1, 2, 3.
Quercus Robur, Linn. 1, 2, 3.
Castanea sativa, Mill. 2, 3.
Fagus sylvatica, Linn. 1, 2, 3.
Salix alba, Linn. 1, 2, 3.
Empetrum nigrum, Linn. 1, 2, 3.
Pinus sylvestris, Linn. 1, 2, 3.
Juniperus communis, Linn. 2, 3.
Elodea canadensis, Michx. 2, 3.
Listera ovata, R.Br. 3.
L. cordata, R.Br. 2, 3.
Orchis mascula, Linn. 1, 2, 3.
O. incarnata, Linn. 1, 2, 3.
O. maculata, Linn. 1, 2, 3.
Habenaria conopsea, Benth. 1, 2, 3.
H. albida, R.Br. 2.
H. bifolia, R.Br. 2, 3.
H. chlorolæuca, Ridley. 1, 2, 3.
Iris Pseudacorus, Linn. 1, 2, 3.
Allium ursinum, Linn. 1, 2, 3.
Scilla festalis, Salisb. 1, 2, 3.
Narthecium Ossifragum, Huds. 1, 2, 3.
Juncus bufonius, Linn. 1, 2, 3.
J. squarrosus, Linn. 1, 2, 3.
J. effusus, Linn. 1, 2, 3.
J. conglomeratus, Linn. 1, 2, 3.
J. maritimus, Lam. 1, 2, 3.
J. supinus, Mœnch. 1, 3.
J. lampocarpus, Ehrh. 1, 2, 3.
J. acutiflorus, Ehrh. 1, 2, 3.
Luzula vernalis, D.C. 2.
L. maxima, D.C. 1, 2, 3.
L. campestris, D.C. 1, 2, 3.
L. erecta, Desv. 1, 2, 3.
Typha latifolia, Linn. 3.
Sparganium ramosum, Huds. 2, 3.
Arum maculatum, Linn. 3.
Lemna minor, Linn. 1, 2, 3.
Alisma Plantago-aquatica, Linn. 2, 3.
A. ranunculoides, Linn. 2, 3.
Triglochin palustre, Linn. 1, 2, 3.
T. maritimum, Linn. 1, 2, 3.
Potamogeton natans, Linn. 1, 2, 3.
P. polygonifolius, Pour. 1, 2, 3.
P. heterophyllus, Schreb. 2.
P. nitens, Web. 3.
Ruppia rostellata, Koch. 3.
Eleocharis palustris, R.Br. 1, 2, 3.
E. multicaulis, Sm. 1, 2, 3.
Scirpus fluitans, Linn. 1, 2, 3.
S. pauciflorus, Light. 1, 2, 3.
S. cæspitosus, Linn. 1, 2, 3.
S. lacustris, Linn. 2.

Eriophorum vaginatum, Linn. 1, 2, 3.
E. angustifolium, Roth. 1, 2, 3.
Rhynchospora alba, Vahl. 1.
Zostera marina, Linn. 3.
Schœnus nigricans, Linn. 1, 2, 3.
Cladium jamaicense, Crantz. 1.
Carex pulicaris, Linn.
C. arenaria, Linn.
C. vulpina, Linn.
C. echinata, Murr.
C. ovalis, Good.
C. Goodnowii, J. Gay.
C. flacca, Schreb.
C. pilulifera, Linn.
C. sylvatica, Huds.
C. flava, Linn.
C. hirta, Linn.
C. acutiformis, Ehrh.
C. rostrata, Stokes.
Phalaris canariensis, Linn. 2, 3.
P. arundinacea, Linn. 1, 2, 3.
Anthoxanthum odoratum, Linn. 1, 2, 3.
Alopecurus geniculatus, Linn. 1,2,3.
A. pratensis, Linn. 1, 2, 3.
Phleum pratense, Linn. 1, 2, 3.
Agrostis canina, Linn. 1, 2, 3.
A. palustris, Huds.
b. stolonifera, Linn. 1, 2, 3.
c. maritima, Mey. 1, 3.
A. vulgaris, With. 1, 3.
pumila, Linn. 1, 3.
Ammophila arundinacea, Host. 1, 2, 3.
Aira caryophyllea, Linn. 1, 2, 3.
A. præcox, Linn. 1, 2, 3.
Deschampsia cæspitosa, Beauv. 1, 2, 3.
D. flexuosa, Trin. 1, 2, 3.
Holcus mollis, Linn. 1, 2, 3.
H. lanatus, Linn. 1, 2, 3.
Arrhenatherum avenaceum, Beauv. 1, 2, 3.
Sieglingia decumbens, Bernh. 1, 2, 3.
Phragmites communis, Trin. 1, 2, 3.
Cynosurus cristatus, Linn. 1, 2, 3.
Molinia varia, Schrank. 1, 2, 3.
Catabrosa aquatica, Beauv., b. littoralis, Parn. 3.
Melica uniflora, Retz. 1, 2, 3.
Dactylis glomerata, Linn. 1, 2, 3.
Poa annua, Linn. 1, 2, 3.
P. pratensis, Linn. 1, 2, 3.
P. trivialis, Linn. 1, 2, 3.
Glyceria fluitans, R. Br. 1, 2, 3.
G. maritima, Mert. and Koch. 1, 3.
Festuca ovina, Linn. 1.
b. capillata, Hackel. 1.
F. elatior, Linn. 1, 2, 3.
Bromus ramosus, Huds. 1, 2, 3.
B. sterilis, Linn. 1, 2, 3.
B. mollis, Linn. 1, 2, 3.
Brachypodium gracile, Beauv. 1.
Lolium perenne, Linn. 1, 2, 3.
c italicum, Braun. 3.
Agropyron caninum, Beauv. 1, 2, 3.
A. repens, Beauv. 1, 2, 3.
A. junceum, Beauv. 1, 3.
Nardus stricta, Linn. 1, 3.
Hymenophyllum tunbridgense, Sm 2.
H. unilaterale, Bory. 2.
Pteris aquilina, Linn. 1, 2, 3.
Lomaria Spicant, Desv. 1, 2, 3.
Asplenium Adiantum-nigrum, Linn 2, 3.
A. marinum, Linn. 1, 3.
A. Trichomanes, Linn. 1, 2, 3.
A. Ruta-muraria, Linn. 1, 2, 3.
Athyrium Filix-fœmina, Roth. 1,2,3.
Scolopendrium vulgare, Symons. 3.
Polystichum angulare, Presl. 3.
Lastræa Oreopteris, Presl. 1, 2, 3.
L. Filix-mas, Presl. 1, 2, 3.
L. dilatata, Presl. 1, 2, 3.
Polypodium vulgare, Linn. 1, 2, 3.
Phegopteris Dryopteris, Fée. 1, 3.
Osmunda regalis, Linn. 1.
Botrychium Lunaria, Sw. 2.
Equisetum arvense, Linn. 1, 2, 3.
E sylvaticum, Linn. 1, 2, 3.
E. palustre, Linn. 1, 2, 3.
E. limosum, Sm. 2, 3.
Lycopodium Selago, Linn. 2.
L. clavatum, Linn. 2.
L. alpinum, Linn. 2.
Selaginella selaginoides, Gray. 2, 3.
Isoetes lacustris, Linn. 2.

In Memoriam.—Alexander Somerville, B.Sc., F.L.S.

Died 5th June, 1907.

Alexander Somerville was born in Glasgow in the year 1842. He was the eldest son of the Rev. A. N. Somerville, D.D., minister of the Anderston congregation of the Church of Scotland, and afterwards, for many years, of Free Anderston Church, Glasgow. He was educated at the Glasgow Academy, and subsequently attended for three sessions at the old college in High Street. After leaving college he entered upon a business career. Several years having thus been spent in the house of Messrs. J. H. Young & Co., merchants, Glasgow, he went to Calcutta as a merchant in the well-known house of Messrs. Mackinnon, Mackenzie, & Co., but, after fifteen years of exposure to the trying climate of India, his health became impaired and he returned to Scotland. At this period of his life his literary and scientific tastes seem to have strongly asserted themselves. He once more matriculated as a student in the university (now established in its stately range of new buildings at Gilmorehill), where he attended science classes, and in due course obtained the degree of Bachelor of Science. To the pursuit of natural history, which had formerly engaged his attention in boyhood, he applied himself once more with increased devotion. His two favourite departments of research were Marine Zoology and Systematic Botany, both of which were studied by him for many years with characteristic enthusiasm. His marine investigations led him to make many dredging excursions, in which he was often accompanied by naturalist friends who possessed tastes similar to his own. In this way he explored the whole of the Clyde Sea Area and the greater part of the western coast of Scotland. He was accustomed to preserve manuscript records of these excursions, in which the most exact information was noted as to the places where the dredging was conducted, the depths from which the respective hauls were taken, and the species of organisms and number of specimens so obtained. As the marine mollusca attracted his special notice, he corresponded with the most eminent British conchologists, and soon became a recognised

authority on the subject of British shells. In 1886 he published a List of British Mollusca and Brachiopoda, which was accepted as the standard catalogue until superseded in 1900 by the official list of the Conchological Society of Great Britain and Ireland. His appointment by that society as one of the three referees for marine shells may be regarded as indicating the high estimation in which his attainments as a conchologist were held.

In the department of Scottish Topographical Botany, particularly in the investigations for working out the flora of the Watsonian vice-counties, his important researches—carried on chiefly in the West of Scotland, but occasionally extended to Orkney and other remoter regions—have led to the acquisition of much valuable information relating to plant-distribution, including many interesting records of the occurrence of species in districts where they were not previously known to exist In the course of this work he entered into correspondence with the recognised authorities in various departments of botany, to whom he was likewise accustomed to submit specimens of the plants upon which his records were based, thus greatly enhancing the value of the information due to his individual researches. He also formed an herbarium of British Flowering-plants and Ferns, upon which he expended so much careful labour as to render it one of the finest in the country.

After returning to Glasgow from India, he became connected with various scientific institutions. One of the earliest to be joined was the Linnean Society, of which he was a Fellow. He was elected a member of the Natural History Society of Glasgow on 13th September, 1881, and a Fellow of the Botanical Society of Edinburgh on 11th February, 1886. He was a member of the Conchological Society of Great Britain and Ireland, and for a number of years held office on the council of that institution, and was for a period of three years its president. He was also a member of the Philosophical Society of Glasgow, and a member of the West of Scotland Marine Biological Association. He was deeply interested in the movement which resulted in the establishment of the Marine Biological Station at Millport, and took an active part in obtaining the funds necessary for its equipment and maintenance. His personal efforts were instrumental in obtaining many valuable gifts, alike from private

individuals and public institutions. One of the most notable of these was the collection of Reports of the *Challenger* Expedition, now contained in the library at the Millport Station, which has proved very helpful to students and others in the course of their biological researches there.

But his sympathies extended over a much wider field than was embraced in those departments of science which specially attracted his notice. As an elder and Sabbath-school teacher he took a prominent part in congregational work, while many philanthropic objects, both at home and abroad, received his hearty support.

There is reason for believing that every society and institution in which Mr. Somerville became actively interested derived benefit from his keen enthusiasm, clear business insight, unflagging energy, and unfailing perseverance When convinced of the goodness of a cause which appealed to his sympathies, or the advantages of a policy which he desired, he was seldom daunted by difficulties or dismayed by obstacles in the way of its attainment. His personal enthusiasm was itself instrumental in persuading others to arrive at his own way of thinking; while those who were frequently brought into contact with him know how unsparing were his efforts, how voluminous his correspondence, how importunate his appeals, in seeking to further a desired end. As a Society we must gratefully remember how often such efforts were successfully made by him on our behalf, and how largely they have resulted in the attainment of benefits of which we are now in the enjoyment.

Besides rendering many services as a contributor of specimens and papers at the meetings of this Society, he occasionally held office in the Council. He acted as a Vice-President from 1888 till 1891, and in 1899 was elected President for a full term of three years. During his tenure of office as President, a special meeting was held on 4th December, 1901. for the purpose of celebrating the Jubilee of the Society, and its success was in great measure due to his personal efforts to render the proceedings worthy of the occasion.

Although, owing to his failing health, a considerable period had elapsed since his last appearance at the meetings of the Society, many indications were from time to time received of his

continued interest in its proceedings and unabated desire for its welfare.

Mr. Somerville was twice married, and is survived by his widow, two sons, and four daughters. To them must be accorded the sympathy of a very wide circle of friends, united together in mourning the loss of a fellow-worker, counsellor, and companion, whose memory will be cherished alike for his high attainments and personal worth.

Auchendrane and its Trees.

By John Renwick.

[Read 25th June, 1907.]

Two hundred years ago, in 1707, the Parliaments of England and of Scotland were united and became the Parliament of Great Britain. One of the members of the Scots Parliament who voted in favour of the Union was John Muir of Blairstoun or Middle Auchendrane, who represented the burgh of Ayr. He had been a magistrate of the "auld toun" as early as 1672, was provost before 1688, and in 1690 was elected provost and commissioner of Parliament for the burgh. He was elected the first representative of the burgh in the new Parliament of Great Britain, and died in 1709 or 1710 at a great age, "having been engaged in the trade and public business of Ayr during a period of nearly 60 years, remarkable for civil commotions and great events" (Paterson, *History of Ayrshire*, vol. II., p. 363).

In honour of the Union, John Muir planted in 1707 a row of "Norwegian Pines," now called Silver Firs, which have since been known in the family as "The Union Trees." They are six tall and stately trees, rising to a height of over 100 feet, with a girth of from 16 ft. 5 in. downwards. Other trees planted about the same time are a Silver Fir now 110 ft. high, and two Scots Firs respectively 90 and 92 ft. high, with girths of 10 ft. 5 in. and 11 ft. 6 in. From an old document, Miss Cathcart, the present proprietor of the estate, learns that in 1698 John Muir sold £300 worth of fine Oaks.

John Muir's great grandson, Robert Muir, studied medicine in London, and graduated as M.D. He was born in 1736, and apparently on coming of age in 1757 he planted a Silver Fir, which in memory of him is known as "The Doctor." It has flourished well, its height being over 101 ft., girth 15 ft., and annual rate of increase in girth (1·22 in.) for whole life greater than that of any of the other trees.

Dr. Muir was survived by a daughter, Mary, who married David Cathcart of Alloway, afterwards elevated to the Bench, under the title of Lord Alloway. During their time many Oaks were taken away, and many trees planted to replace these. Their son, Elias Cathcart, graduated as LL.D. in the university of Leyden in 1815, was married to Miss Dunlop in 1818, succeeded to the property in 1829 on the death of his father, sold Alloway in 1830, and in the same year, "under the old name of Auchendraine, united his estate of Blairstoun, with the adjoining barony of Auchendraine which he acquired from the parliamentary trustees of Sir James Fergusson of Kilkerran" (Paterson, *Hist. Ayrshire*). This barony had been disponed by Hugh Mure of Auchendrane in 1741 to Sir James Fergusson, second baronet of Kilkerran. Hugh Mure was a descendant of the "Grey Man of Auchendrane."

Elias Cathcart had a family of two sons and three daughters, of whom the only survivor is the eldest daughter, the present proprietor of the estate, Miss Jane A. Cathcart.*

At the time of her marriage, Mrs. Elias Cathcart, or Miss Dunlop, planted a Birch on the lawn in front of the house. In looking over some old letters last year, Miss Cathcart discovered that the Birch had been brought, with other rare plants, in the year 1818, from Booth's gardens in Hamburg, as "The cut-leaf Weeping Birch." It exhibits the pendulous habit to a slight degree, but only in some of the young leaves does it show any traces of cut leaves. It is now probably the finest tree of the species in Scotland, and nearly the largest. It has a height of 67 feet, spread of 60 feet, girth 10 feet 8½ inches, bole 13 feet.

Another tree that seems to be one of the best of its kind in the United Kingdom is a Western Arbor Vitae, *Thuya occidentalis*, L. In the first volume of *The Trees of Great*

* I regret to note that Miss Cathcart died on 25th January, 1909, when in her eighty-ninth year.—J. R., Jan., 1911.

Britain and Ireland, by H. J. Elwes, F.R.S., and A. Henry, F.L.S., the former writes (p. 194), "*Thuya occidentalis* never attains to a considerable size when planted in this country. There is a specimen at White Knights, near Reading, of great age, which is now dying at the top. According to the gardener there, it has not made any growth for the last thirty-five years. It measured in 1904, 41 feet in height by 4 feet in girth. At Stratton Strawless, Norfolk, there is also a specimen of considerable age, remarkable for the pendulous habit of the branches, which is 35 feet in height. There are more large specimens at Belton Park than at any other place I know in England, the largest I have measured being 41 feet by 3 feet 9 inches. Henry, however, in 1904 measured one at Arley Castle as tall, which divides into three stems near the ground, where it measures 7 feet 6 inches in girth At Auchendrane, Ayrshire, Renwick measured a tree in 1902,—which, according to a specimen procured by him in 1906, was *Thuya occidentalis*,—as 42 feet high, by 6 feet 8 inches in girth, with a bole of 12 feet."

Another remarkable tree is the True Service-tree, or Sorb, *Pyrus Sorbus*, Gaertn., or *P. domestica*, Ehr. It has a height of 57 ft., a girth of 5 ft. 7 ins., with a bole of 9 ft. The forester has not observed it in fruit. Unfortunately the description of this species by Messrs. Elwes and Henry was printed before I sent a specimen. They give no measurements for Scotland, but it is likely that the Auchendrane tree is equal to any in this country. They say that the largest now living in the United Kingdom seems to be one in Co. Kilkenny, 77 ft. high by 10 ft. 8 in. in girth; that Loudon mentions a tree in Dorsetshire 82 ft. high, diameter 3 ft. 4 in. (= girth 10 ft. 6 in.), which, if a true Sorb, must have been the largest on record, but it has long been dead. They record several in England, such as one at Wetherby 65 ft. high by 9 ft. girth, and one at Arley Castle 55 ft. high by 7 ft. 4 in. girth. The tree at Arley Castle was a seedling from the single specimen which grew in a remote part of Wyre Forest in Worcestershire, on whose existence as a native the species was admitted to the British Flora. This tree in Wyre Forest was mentioned in the *Philosophical Transactions* as far back as 1678. It was burnt down in 1862 by a fire kindled at its base by a vagrant. The species is not now considered as a native. (Elwes and Henry, Vol. I. p. 147.)

Still another good tree is a specimen of the Golden Birch, *Betula lutea*, Micheux, 57 ft. high, bole 15 ft., girth 5 ft. 2½ in. Dr. A. Henry, F.L.S., to whom I am indebted for the name, states that it is a remarkably fine one for the British Isles. It agrees with an excellent specimen at Tortworth, but has smaller leaves. The leaves have a peculiar white or pale colour beneath, which does not occur in any Kew trees of the species. The taste of the bark of the young branchlets is peculiar and exactly that of *B. lutea*.

In addition to those already mentioned, and those contained in the appended table of measurements, the following trees and shrubs have been observed, and quite likely others exist which have not been noticed :—

Tulip Tree, - - - -	*Liriodendron Tulipifera*, L.
Three-petaled Magnolia, -	*Magnolia tripetala*, L.
Spindle-tree, - - -	*Euonymus europæus*, L.
Norway Maple, - - -	*Acer platanoides*, L.
Ohio Buck-eye, or Smooth-leaved Horse Chestnut, -	*Æsculus glabra*, Willd.
Red Horse Chestnut, - -	,, *carnea*, Hayne.
Mahaleb, - - - -	*Prunus Mahaleb*, Mill.
Goat's Beard, - - -	*Spiræa Aruncus*, L.
Willow-leaved Pyrus, - -	*Pyrus salicifolia*, L.
Cockspur, - - - -	*Crataegus Crus-galli*, L.
Hawthorn, - - - -	,, *Oxyacantha*, L.

One with "witches' broom"—a somewhat uncommon occurrence.

Curly-leaved Ash, - -	*Fraxinus excelsior*, L., var. *crispa*
Smooth Elm, - -	*Ulmus glabra*, Mill.
Fringe-leaved Alder, - -	*Alnus glutinosa*, Gaertn., var. *laciniata*.
Cut-leaved Hornbeam, - -	*Carpinus Betulus*, L., var. *incisa*.
Red Oak, - - -	*Quercus rubra*, L.
Silvery Oak, - - -	,, *pedunculata*, Ehr., var. *variegata*.
Copper Beech, - - -	*Fagus sylvatica*, L., var. *cuprea*.
Oriental Plane, - - -	*Platanus orientalis*, L.
Wellingtonia, - - -	*Sequoia gigantea*, Decaisne.

Some time ago Mr. William Kelso of Ayr gave me a list of "a few of the more uncommon plants found near Auchendrane."

It includes *Ranunculus auricomus*, L., which Mr. John Smith (*Botany of Ayrshire*, p. 7) states has been recorded for Monkton by Mr. Duncan, and for Craigie by Mr. Borland, but he himself has not seen it in Ayrshire; *Nuphar luteum*, Sm.; *Nymphæa alba*, L.; *Agrimonia Eupatoria*, L.; *Chrysosplenium alternifolium*, L., recorded by Mr. Smith for only three parishes, Kilbirnie, Dalry, Loudoun; *Adoxa Moschatellina*, L.; *Solanum Dulcamara*, L.; *Salix fragilis*, L.; *Neottia Nidus-avis*, L.; *Allium ursinum*, L.; *Asplenium Trichomanes*, L.; *Scolopendrium vulgare*, L.; *Polypodium Dryopteris*, L. (= *Phegopteris Dryopteris*, Fée); also *Symphoricarpus racemosus*, Mx.

Auchendrane has something still to show on the bonnie holms and banks of Doon!

Measurements of Trees at Auchendrane.

Supplementary to Table in *Transactions*, Vol. VII. (N.S.), p. 270.

Species.	Date.	Girth.	at Bole.	Height.
		Ft. In.	Ft.	Ft.	Ft.
Tilia platyphyllos, Scop. var. *aspleniifolia*; Cut-leaved Lime Tree, - - -	July, '07	2 $11\frac{3}{4}$	3	9	42
Acer platanoides, L. var. *laciniatum*; Eagle's-claw Maple, - - - -	,, ,,	3 $2\frac{1}{4}$	5	7	48
Pyrus Sorbus, Gaertn.; True Service Tree, - - -	June, ,,	5 7	5	9	57
Prunus serotina, Loi.; American Gean, - - -	July, ,,	5 8	2	3	42
Prunus Mahaleb, Mill., -	Sept., ,,	3 7	1·5	3	20
Betula lutea, Mx.; Yellow Birch, - - - -	,, ,,	5 $2\frac{1}{2}$	5	15	57
Ulmus glabra, Mill.; Elm (not "*Zelkowa crenata*" as in table *loc. cit.*), - - -	July, ,,	5 $10\frac{1}{2}$	5	12	63
Fagus sylvatica, L.; Beech, to west of house, - -	Sept., ,,	10 $11\frac{1}{2}$	5	25	67*
Thuya occidentalis, L.; Western Arbor Vitæ, -	June, ,,	6 $10\frac{1}{2}$	5	12	42*

* Height in 1902.

Species.	Date.	Girth at Bole.		Height.		
		Ft.	In.	Ft.	Ft.	Ft.
Thuya plicata, Don (*gigantea*, Nut.); Giant Thuya, -	June, '07	5	2	5	—	—
Abies pectinata, DC.; Silver Fir. No. 1 of "The Union Trees," planted 1707, - - - -	July, „	16	$5\frac{1}{4}$	5	—	104
Do., on stable path,	April, '06	12	$2\frac{3}{4}$	5	—	—
Pseudotsuga Douglasii, Carr; Douglas Fir, - - -	„ „	5	$10\frac{3}{4}$	5	—	—
Picea excelsa, L.; Spruce, -	July, '07	5	$11\frac{1}{2}$	5	—	—
Cedrus atlantica, Manetti; Atlas Cedar, - - -	„ „	5	$2\frac{1}{2}$	5	—	60
Pinus sylvestris, L.; Scots Fir, in flower garden, planted 1707, - - - - -	„ „	10	5	5	21	87*
Larix europæa, DC.; Larch, near bridge, - - -	June, '07	8	$2\frac{1}{2}$	5	—	—

* Height in 1902.

Notes on Richardson's Skua (*Stercorarius crepidatus*, Gm.).

By Robert W. S. Wilson.

[Read 23rd June, 1908.]

Richardson's Skua belongs to the small group of parasitic gulls, of which we have four species in this country, namely, the Great Skua (*Megalestris catarrhactes*, L.), Pomatorhine Skua (*Stercorarius pomatorhinus*, Temminck), Richardson's Skua (*S. crepidatus*, Gmelin), and the Long-tailed Skua (*S. parasiticus*, L.), the first and third being nesting species here. Richardson's Skua is the most abundant of the genus, nesting in plenty on the Orkney and Shetland Islands, and more sparingly on the Hebrides and in some parts of the North of Scotland. In the Clyde Area, it occurs in spring and autumn in most years. At Fairlie I have observed it from the beginning of August till November.

It is a bird of rather curious habits. When intent on feeding, it may be seen flying about, watching the Common Gulls and Kittiwakes in their attempts to catch fish. Whenever one of the latter manages to secure a fish, the Skua immediately gives chase, and buffets the poor bird with such violence as to compel it to drop the fish, which the Skua catches before it reaches the water.

On 4th June, 1904, when on the Island of Yell in the Shetlands, I had for the first time an opportunity of seeing this species inland. We were walking over to West Sandwick at the time, and on catching sight of the bird we at once followed it, and found it perched on a mossy knoll. It then flew away, and disappeared behind a distant ridge. Having followed it, we came upon the pair of birds on a patch of flat mossy ground behind the ridge where the first Skua had disappeared. They speedily showed by their actions that they had a nest close at hand, as they began to swoop at us, always making the attack from behind. When we approached more closely, the birds alighted on the ground, sat on their tails, and propelled themselves along the surface by flapping their wings, as though they had been wounded and were unable to fly. We soon found the nest, which was but a slight hollow scooped in the moss, and lined with a few bits of grass. It contained two eggs.

Next day we visited a colony of these birds. This was in a wild stretch of country, studded with lochs, in the north part of the island. They were not nesting close together, but each pair had a patch of ground reserved for themselves; and whenever this area was intruded upon by either a gull or another skua, the occupants gave battle, attacking the intruder with such force as to cause feathers to fly. The impact of the two birds' bodies meeting in mid-air was quite perceptible to the ear. Their notes, which they constantly uttered, resembled the mewing of a cat. They had two distinct types of plumage, one with light throat and breast, and the other sooty all over. A pair of Great Skuas had also taken up their quarters in this locality, and it was interesting to observe the different manner in which the two species showed their resentment of our intrusion in their haunts. The Great Skuas always made a frontal attack, sweeping down from a height and coming at the intruder in a horizontal

direction, at a height just sufficient to clear his head. The velocity of the swoop being very great, and the "swish" of the wings growing louder as the birds approached, made one involuntarily duck the head to avoid their onslaught. On the other hand, the attack of Richardson's Skua generally came from behind, or sometimes from the side, but never from the front. It was made by the birds dipping down in a vertical direction from a height of from fifteen to twenty yards, but they never actually touched us, as their larger and bolder relatives sometimes did.

On Two New Forms of *Carex*.

By Peter Ewing, F.L.S.

[Read 23rd June, 1908.]

Carex saxatilis Linn., forma glomerata mihi.

Despite the number of described forms of *Carex saxatilis* L., I wish to direct attention to another which is so distinct as to be well worthy of special recognition. It occurs on Ben Lawers and Beinn Heasgarnich, and has all along been apparently overlooked as a small form of *C. atrata* L., to which in facies it closely approaches, as may be seen from the following description :—

> Rootstock shortly creeping, with light-brown and bright-purple coloured sheaths, the barren shoot and the following year's barren shoot curved upwards from the base. Leaves narrow, strict, slightly keeled, revolute, with angular points, edges rough, shorter than the stems. Stems stout, 20-30 cm. high, bluntly triangular, scarcely rough at the top. Spikes 3-4, bluntly ovate-oblong, upper spikelet very shortly stalked, next sessile at its base, next shortly stalked, lowest on a long stalk, terminal spike may be all male or all female or partly both, and stamens are often seen on the other spikes. Lower bract leaf-like, not sheathing. Glumes lanceolate, acuminate, dark-purple with a lighter tip, midrib slender, only visible on some of the glumes. Perigynia yellowish at the base, purple above, broadly ovate, slightly inflated, veinless except at sides, neck and bifid beak distinct, stigmas two.

This form has a good deal in common with *C. atrata*, but the influence of that species is questionable. As with all other deviations from the type, it is difficult to find a plant so fully developed in all its parts as to enable all questions of affinity to be definitely settled.

C. SAXATILIS Linn., forma INTERMEDIA mihi.

This form should come under *C. vesicaria* L., as it seems intermediate between *C. Grahami* Boott, and *C. saxatilis* L., but differs from the former in being 15-30 cm. high, not growing cæspitose, and having leaves much shorter and flatter; from the latter it differs in having 1-3 female spikelets, the lower one cylindrical on a long hair-like peduncle and hanging when mature; lower glumes longer and upper as long as the perigynia, subulate, blackish-brown with a light-coloured midrib and white tip, perigynia as in *C. Grahami* but darker coloured, stigmas three, style not so geniculate as in the type.

This is the form which the artist had before him when he drew plate 1684, and also the perigynia at the foot of the plate, in the 3rd edition of *English Botany*.

In the young state, dried plants of this are so like small plants of *C. Grahami* that they are liable to be confused with it; in fact, there are a few specimens mixed with the small form of *C. Grahami* in the Royal Herbarium at Edinburgh.

Some authors regard this as the form *alpigena* Fr., thereby causing the difficulty experienced in trying to diagnose that form.

Only on one of the Breadalbane mountains does this occur at all plentifully, and there it grows in company with *C. saxatilis* and *C. Grahami*, being to all appearance a hybrid between these forms, of which *C. Grahami* is the male parent.

Reports on Excursions.*

DALRY TO FAIRLIE, 15th September, 1906.—Mr. D. A. Boyd reported that this excursion, which was arranged jointly with the West Kilbride Natural History and Archæological Society, took place during very unfavourable weather, and the attendance was accordingly small. Having met at Dalry railway station,

* The Lists of Mosses, Hepatics, and Microfungi noted at Excursions in 1907 and 1908 have been incorporated as a Supplementary Report (see p. 263).

the party visited the old manse, which is situated near the centre of the town, close to the churchyard, and dates from the seventeenth century. In the neighbourhood of Dalry were observed *Polygonum Bistorta*, L.; *Hygrophorus calyptræformis*, B. & Br.; *Marssonia populi*, Lib., on leaves of *Populus;* and *Ovularia sphæroidea*, Sacc., on leaves of *Lotus uliginosus*, Schkuhr.; with various other plants. During the descent towards Fairlie, beautiful views were obtained of the shores and islands of the Firth of Clyde; but the wet condition of the long herbage interfered with botanical pursuits.

Hawkhead, 29th September, 1906; and Torrance (East Kilbride), 13th October, 1906.—Mr. R. B. Johnstone, conductor. Messrs. Johnstone and Boyd reported that these excursions were arranged jointly with the Andersonian Naturalists' Society, and took the form of Fungus Forays. The attendance on both occasions was satisfactory. At Hawkhead the species noted did not include any which are worthy of special mention, but at Torrance numerous interesting forms were obtained. Among the Hymenomycetes, the most notable species observed in the latter locality were *Mycena pterigena*, Fr., *M. capillaris* (Schum.) Fr, *Pleurotus dryinus* (Pers.) Fr., *Lactarius pallidus*, Fr., and *Poria sanguinolenta* (A. & S.) Fr. The Microfungi found at Torrance included *Ciboria luteovirescens* (Rob.) Sacc., which grew on dead petioles of *Acer Pseudo-platanus; Cyathicula coronata* (Bull.) De Not., on a dead herb-stem; *Ascobolus vinosus*, Berk., on rabbit-dung; *Torula ovalispora*, Berk., on dead wood; &c.

South Bute, 1st April, 1907.—Mr. John Robertson, conductor. This excursion took place in favourable weather, and was attended by eighteen members and friends. After landing at Kilchattan Pier, the party proceeded behind the village to the road which passes through Suidhe Plantation, and visited the Standing Stones in Blackpark Plantation. These consist of three upright blocks, of the history of which nothing authentic is known. Returning to the road, the party walked by Largizean and Lubas to the seashore at Dunagoil Bay. All clambered to the top of Dunagoil ("the fort of the stranger"), a boss of trap rock which marks an ancient headland, and has several sea-worn caves at its

base. Dunagoil was a vitrified fort, of which part of a wall still remains. Whether the vitrification was merely accidental, caused by strong wind blowing up from the sea so as to occasion fierce combustion with great heat, or whether it was produced intentionally, is a subject upon which authorities do not seem to be agreed. After having rested and enjoyed the beautiful view obtainable from the fort, the party proceeded to St. Blane's Chapel, also known as Kilblain and Kingarth. This is a ruin of uncertain age, which nestles in a delightful and sheltered hollow. The style of architecture is mainly Norman, with some early Gothic windows. The Norman portion, however, seems to cover a building of an earlier date, while the Gothic windows mark a third style, of date still later than the Norman. The Rev. Dr. Hewison, in his book entitled *Bute in the Olden Time*, considers that the original edifice, which is still the framework of the present building, was erected under the supervision of St. Blane, who died about the year 630. From the chapel the hill-path over the flank of Suidhe Chatain was followed. This hill is 517 feet high, and from its summit a series of magnificent views present themselves in every direction. From no other coign of vantage can so fine a prospect of the Arran mountains be obtained.

The list of Birds observed in the course of the day was not a long one, but some members of the party, who had been down at Kilchattan Bay over the week-end, had noted 63 species—a record which at that early season could hardly be excelled elsewhere in the Clyde Area. Only a few of the early Flowering-plants were seen in bloom.

Among the Microfungi noted were *Pseudophacidium calluna*, Karst., and *Coniothyrium Boydeanum*, A. L. Smith. The former was added to the British List from specimens discovered at West Kilbride, Ayrshire, in March, 1892,* and the latter was described as new to science from specimens obtained in that district in October, 1899.† So far as can be ascertained, no additional British records of these species have as yet been reported, and they accordingly form interesting additions to the fungus flora of Bute.

* *Journal of Botany*, May, 1898; *Transactions of the British Mycological Society*, 1897-98, p. 73.

† *Journal of the Royal Microscopical Society*, 1900, p. 423, pl. 3, fig. 3; *Trans. Brit. Myc. Soc.*, 1899-1900.

Lochwinnoch, 13th April, 1907.—Mr. Charles Scott, conductor. During fine weather a party of about thirty, consisting of members of this and the Andersonian Naturalists' Societies, visited the south-east side of Castle Semple Loch, between Lochside and Howwood railway stations. Few Flowering-plants were observed in bloom, and these were all common species. Fifty-two species and varieties of Mosses were noted.

Calderwood Glen, 27th April, 1907.—Mr. John Middleton, B.Sc., conductor. This excursion was arranged jointly with the Hamilton and District Field Club and the Uddingston Literary Society. The rendezvous was Calderwood Estate, near High Blantyre, which was visited by permission kindly granted by the Scottish Co-operative Wholesale Society, into whose hands the property has recently passed. The party proceeded through beautiful sylvan paths to the castle, where they were joined by Mr. Thomson, estate manager, who gave an account of the historical facts and legendary traditions connected with the glen. Among the plants observed were several specimens of Toothwort (*Lathræa squamaria*, L.) in fine flower, and *Chrysosplenium alternifolium*, L., which was found in considerable abundance. Under the leadership of Mr. John R. Lee, some of the party explored the glen in search of Mosses, of which several interesting species were obtained.

Cartland Crags, 18th May, 1907.—Mr. John Paterson, conductor, reported that this excursion took place during favourable weather, and was attended by eighteen members and friends. Cartland Crags is classic ground for Clydesdale naturalists, and has often been visited by the Society. On this occasion attention was chiefly directed to two aspects of the life of the region, viz., its ornithology and botany. Cleghorn Woods and Cartland Crags present almost unrivalled opportunities for observing sylvan bird-life. There are two rookeries of moderate size in Cleghorn Woods, while the steep banks and cliffs afford shelter to many Jackdaws. The stream yields the Dipper and Grey Wagtail, and here, also, the Chaffinch as flycatcher is a prominent feature. While most of our sylvan summer visitors were common enough, it was observed that the Garden Warbler was neither seen nor heard. As this species had been found to be quite common on

previous visits, the explanation of its apparent absence was perhaps the somewhat ungenial conditions obtaining at the time of the excursion. A Roe-Deer was seen in Cleghorn Woods.

Mr. D. A. Boyd reported that specimens of *Trichoniscus pusillus*, Brandt, one of the terrestrial Isopoda, and *Tomocerus tridentiferus*, Tullb., one of the Collembola, were observed under rotten wood in moist places. Most of the rarer plants recorded at former visits to the district were again observed. Among the Mosses obtained were specimens of *Hypnum Schreberi*, Willd., with capsules. Thirty-five species of Fungi were noted, among which were *Polystictus radiatus*, Fr., found on dead branches of *Alnus glutinosa*; *P. abietinus*, Fr., on a dead trunk of *Pinus sylvestris*; and *Grandinia granulosa*, Fr., on dead wood. The Microfungi are included in a separate report.

Loch Riddon, 23rd May, 1907.—Mr. Alexander Ross, conductor, reported that probably the threatening nature of the weather had accounted for the small number—four in all—who took part in this excursion; but the smallness of the company in no way detracted from enjoyment of the beautiful scenery for which the district is famed. From Colintraive for about a mile and a-half on both sides of the road are plantations of young trees, mainly oak, the varying colours of whose opening foliage make a fine picture. Further on, birch is the prevailing species. Just where the road turns up Loch Riddon, the highest elevation in this part is attained. A splendid view of the Kyles of Bute is here obtainable. Right below, and stretching southward, are the narrows, where the water makes its way between low-lying and dangerous-looking islands. Extending northward, in all its grandeur, is Loch Riddon, a narrow gulf shut in by rugged and precipitous mountains. Attention was directed to a small and inconspicuous island, Eilein Dheirrig, or Eilein Dubh, situated near the mouth of the loch, which recalls the unsuccessful rebellion of 1685, and the part played therein by Archibald, ninth Earl of Argyll.

At the head of the loch, and towards the roadway on the west side, are some fine specimens of Beech and Fir. Ormidale was reached in time to allow of the exploration of Craig Burn, which tumbles down a rugged, rock-strewn course.

Some of the boulders in the bed of the stream were completely clad with the Filmy-Fern, *Hymenophyllum unilaterale*, Bory.

Forty-one species of Birds were noted, ten of these being summer visitors. The song of the Willow Wren accompanied the party during the whole journey. Less common, but still frequent, was the tremulous "shiver" of the Wood Wren, while the call of the Cuckoo was occasionally heard. Near Colintraive the Spotted Flycatcher was seen, and shortly afterwards the Wheatear. The Whinchat was frequent towards the head of the loch, where also the Tree-Pipit was noted in the trees. The Dipper was seen hurrying up a small stream, while Common Sandpipers frequented the River Ruel, and were also seen along the shore. About half-way up the loch, the monotonous call of the Chiff-chaff was listened to for some time. Standing on some mud-flats, in the midst of Oyster-catchers and one or two Curlews, were no less than seven Common Herons. As no heronries have been reported to exist on Loch Riddon, it would be interesting to know from what quarter these birds had come. One pair of Shell-ducks, and several Red-breasted Mergansers, were the only representatives of the duck tribe observed. A Slow-worm (*Anguis fragilis*, Linn.) was captured at the head of the loch.

Entomologically the day was almost barren, probably owing to high wind and want of sunshine. At the head of the loch a brief interval of sunshine brought out several insects, among which were a specimen of *Bombylius major*, L., an uncommon species in the Clyde district, also *Melanostoma mellinum*, L., *Rhingia campestris*, Mg., and a species of *Anthomyia*.

Tipulidæ were scarce, the species netted being *Dixa maculata*, Mg., *Ptychoptera albimana*, F., *Limnobia nubeculosa*, Mg., *Dicranomyia chorea*, Mg., *Rhypholophus nodulosus*, Mcq., *Empeda nubila*, Schum., *Erioptera tænionota*, Mg., *Limnophila aperta*, Ver., *Amalopsis immaculata*, Mg., and *Tipula plumbea*, F.

During the excursion many Flowering-plants were observed, but none sufficiently rare to call for special mention. Reference may be made, however, to the beauty of the masses of Marsh-marigolds and the abundance of Primroses. *Lobaria pulmonaria* (L.) Hoffm., a large foliaceous Lichen, grew luxuriantly on many of the trees. Eighteen Mosses and six Hepatics were noted by Mr. John R. Lee, and are separately reported on.

Auchans and Dundonald, 1st June, 1907.—Mr. D. A. Boyd reported that, owing to the unpromising state of the weather, the attendance, so far as this Society is concerned, was very small. The party travelled by rail to Drybridge, where they were joined by several members of the Irvine Ramblers' Field Club. They then walked to Auchans, where some time was spent in exploring the finely-wooded grounds and visiting the old castle. The latter is now uninhabited, and is fast falling into a state of decay and ruin. It was for some years the residence of Susanna, Countess of Eglinton, where, in 1773, she was visited by Dr. Samuel Johnson after his return from his tour through the Hebrides, as has been duly chronicled by his biographer, Boswell, who has given an interesting account of the interview between the countess and her distinguished guest. From Auchans the party proceeded through the woods to Dundonald Castle, and afterwards had tea in the village before dispersing.

Among the plants observed in the course of the afternoon were *Anemone nemorosa*, L., *Ranunculus bulbosus*, L., *Cardamine amara*, L., *Saxifraga granulata*, L., *Conium maculatum*, L., *Veronica montana*, L., *Listera ovata*, R. Br., *Arum maculatum*, L., and *Polyporus squamosus* (Huds.) Fr. Several Mosses and numerous Microfungi were also noted.

Auchendrane, 15th June, 1907.—Mr. John Renwick, conductor, reported that a small party of this Society, consisting of eleven members and friends, visited Auchendrane to examine the trees and plants growing there. They were courteously entertained by their fellow member, Miss Cathcart. The afternoon was wet, with dry intervals. Many of the largest and most interesting trees were measured,* and a number of photographs were taken. In the woods the Bird's-nest Orchis (*Neottia Nidus-avis*, Rich.) was very plentiful, and the Cuckoo-pint (*Arum maculatum*, L.) was frequent. The former is recorded by Mr. John Smith, in his *Botany of Ayrshire*, for only six parishes, and the latter for only four. Neither species is recorded for Maybole parish, in which Auchendrane is situated. In 1896, Mr. R. M'Kay and Mr. Renwick found *Neottia* in Culzean policies, thus

* For Historical Notes on Auchendrane, and Measurements of Trees, &c., see page 230.

adding another parish (Kirkoswald) to those for which the plant is recorded in Mr. Smith's list. The Twayblade (*Listera ovata*, R. Br.) was in great abundance. Mr. P. Ewing, F.L.S., discovered an unusual grass which he identified as *Poa Chaixii*, Vill. Miss Cathcart stated that it originally came from Switzerland, and that her great-grandfather, Robert Muir, accompanied by his gardener, spent a year gathering plants in that country.

Monkland and Woodhall, 22nd June, 1907.—Mr. A. B. Motherwell, conductor. As a joint-excursion with the Airdrie and Coatbridge Naturalists' Societies, this was attended by a party numbering twenty-six, ten of whom were members of this Society. The weather conditions were not very favourable, owing to a severe thunderstorm, with heavy showers of rain and hail, passing over the district.

As its name implies, the estate of Monkland formed part of the possessions of the monks of the Abbey of Newbattle, in Midlothian, to whom the land now comprehended in the Parishes of Old Monkland and New Monkland was conveyed by King Malcolm IV. in the year 1160. The royal charter is still extant, and conveys the land, with "the woods, mosses, muirs, and meadows thereto belonging." From this we infer that the land was then uncultivated and entirely pastoral. The monks, however, soon brought it under cultivation, and erected at Drumpellier, in the Parish of Old Monkland, a large grange for storing their grain. They also formed a road for cattle and wheeled vehicles from Newbattle Abbey to Drumpellier, which continued to be the high road from Airdrie to Edinburgh until the present turnpike road was made about the year 1791. Portions of the old road can still be seen. Monkland House is in the Scotch Baronial style of architecture. It was erected about the year 1650, and is now the property of Baron Elphinstone of Elphinstone.

With reference to the origin of the name Woodhall, it may be remarked that although the woods surrounding the ruined hall are neither very extensive nor old, there is reason to believe that at the time when the Monklands were conveyed by King Malcolm to the monastery of Newbattle considerable portions of the

original Caledonian Forest still remained. It is recorded that the monks made large quantities of waggons and agricultural implements from the oak and other wood of their lands in Clydesdale. The estate of Woodhall formerly belonged to Campbell of Islay, and is now possessed by Mr. Alexander Whitelaw of Gartshore. The mansion house, which was a handsome and commodious building, was destroyed by fire about fifty years ago. It is situated in the parish of Bothwell, being separated from the parishes of Old and New Monkland by the North Calder Water.

Various species of Isopod Crustacea were observed by Mr. D. A. Boyd, including *Asellus aquaticus* (L.), *Trichoniscus pusillus*, Brandt, *Oniscus asellus*, L., *Porcellio scaber*, Latr., and *Cylisticus convexus* (De Geer). *Nemastoma lugubre* (O. F. Müll.), and *Notonecta glauca*, L., were also noted, as well as numerous species of Mollusca, identified by Mr. Robert Godfrey. The latter included *Arion ater* (L.), *A. circumscriptus*, Johnst., *A. hortensis*, Fér., *A. minimus*, Sim.; *Limax*, one immature specimen, probably of *L. maximus*, L.; *Agriolimax agrestis* (L.), *A. lævis* (Müll.), *Vitrina pellucida* (Müll.), *Hyalinia cellaria* (Müll.), *H. alliaria* (Mill.), *H. crystallina* (Müll.), *H. fulva* (Müll.), *Helix rotundata*, Müll., *Cochlicopa lubrica* (Müll.); *Limnæa stagnalis* (L.), introduced and flourishing; and *Pisidium* sp? on caddis-fly cases.

Mr. Motherwell submitted a list of Flowering-plants, &c. The most notable species were *Geranium sylvaticum*, L., *Hippuris vulgaris*, L., *Scrophularia Ehrharti*, Stev., *Polygonum Bistorta*, L., *Rumex Hydrolapathum*, Huds., *Briza media*, L., and *Ophioglossum vulgatum*, L. Amongst the trees, fine specimens of the Yellow-flowered Horse-chestnut (*Æsculus flava*, Ait. [= *Pavia flava*, Mœnch]) and Hornbeam (*Carpinus Betulus*, L.) attracted the attention of the party.

Various Microfungi were also noted and are mentioned in the Supplementary Report.

Dalry, 29th June, 1907.—Mr. Archibald Shanks, conductor. This excursion was arranged jointly with the West Kilbride Natural History and Archæological Society, and took place during very fine weather. The party walked to Hyndog Glen, where some time was spent in observing the zoological, botanical, and geological features of the Rye Valley. In the course of the

afternoon, 34 species of Birds were noted by Mr. William Rennie. These included the Song Thrush, Blackbird, Redbreast, Whitethroat, Garden Warbler, Willow Wren, Wood Wren, Sedge Warbler, Hedge Sparrow, Long-tailed Titmouse, Great Titmouse, Blue Titmouse, Wren, Pied Wagtail, Yellow Wagtail, Meadow Pipit, Swallow, House Martin, Sand Martin, Greenfinch, House Sparrow, Chaffinch, Yellow Bunting, Starling, Rook, Skylark, Cuckoo, Ring-dove, Corn-crake, Lapwing, Common Sandpiper, Redshank, Curlew, and Black-headed Gull.

Specimens of *Cheiridium museorum* (Leach), a "False-scorpion" new to the Clyde Area, were obtained at Tofts Meal Mill, Dalry, by Mr. Robert Godfrey, who also devoted some attention to the Mollusca occurring in Hyndog Glen. The species observed by him numbered 19, and included *Arion ater* (L.), *A. hortensis*, Fér., *A. minimus*, Sim., *A. circumscriptus*, Johnst., *Limax marginatus* (Müll.), *Agriolimax agrestis* (L.), *Vitrina pellucida*, Müll., *Hyalinia alliaria* (Mill.), *H. nitidula* (Drap.), *H. crystallina* (Müll.), *Helix rotundata*, Müll., *H. nemoralis*, L., *H. arbustorum*, L., *H. hispida*, L., *H. caperata*, Mont., *Pupa cylindracea* (Da Costa), *Balea perversa* (L.), *Clausilia perversa* (Pult.), and *Ancylus fluviatilis*, Müll.

On the way to and from the glen several interesting plants were noted. These included a white-flowered form of *Geranium Robertianum*, L., observed at Broadlie; *Mimulus luteus*, L., at Ryefield; *Scirpus sylvaticus*, L., at the Public Park; and *Bromus sterilis*, L., in the neighbourhood of Dalry railway station. In Hyndog Glen were found *Cardamine amara*, L., *Chrysosplenium alternifolium*, L., *Saxifraga hypnoides*, L., *Geranium sylvaticum*, L., *Lastrea Oreopteris*, Presl.; *Aspidium aculeatum*, Sw., var. *lobatum*, Presl.; *Cystopteris fragilis*, Bernh., *Asplenium Trichomanes*, L., &c. Some very thick stems of Ivy (*Hedera Helix*, L.) were seen, one of which measured two feet in girth.

Finlayston, 10th August, 1907.—Mr. Thomas Anderson, conductor. This excursion was attended by eleven members, who proceeded from Langbank railway station to the eastern gate of Finlayston policies, where they were met by one of the gardeners. Some very fine trees were pointed out, measurements of which were noted by Messrs. John Renwick and Richard M'Kay.

Particular mention may be made of the "John Knox" Yew-tree, which was removed from the wall of the mansion seven years ago and replanted some little distance to the west. It is still in a healthy condition. A very large Turkey Oak (*Quercus Cerris*, L.) grows to the west of the house. Although somewhat damaged through the loss of a large limb, it is quite healthy, and showed a good increase in girth since last measurement was taken. A very large Spanish Chestnut (*Castanea sativa*, Mill., var. *heterophylla*), situated to the east of the house, attracted attention on account of the terminal leaves being almost linear in form. There is a park called "Paradise" to the east of the house, containing three Yew-trees of great age and size. The famous avenue of Lime-trees was also inspected. At Finlayston House the party were met by the proprietor, Mr. G. J. Kidston, who kindly entertained them with refreshments, and afterwards conducted them through the gardens and greenhouses, and invited them to inspect the mansion itself. A fine collection of ancient weapons and armour in the hall was much admired.

Finlayston is of some historic interest. It was long the chief residence of the Earls of Glencairn, having passed by marriage, about the end of the fourteenth century, to Sir William Cuninghame of Kilmaurs, ancestor of that noble family. It continued in their possession until the death of John, the fifteenth and last Earl, in 1796, when the estate devolved upon Mr. Robert Graham of Gartmore. Over thirty-five years ago it was bought by Colonel Buchanan of Drumpellier, and is now the property of Mr. Kidston. The mansion has been much altered from time to time, but the main part is between 400 and 500 years old.

Two Earls of Glencairn are worthy of special notice as connected with the literary history of our country.

Alexander, the fifth, who is often referred to as "the good Earl," succeeded to the estate in 1547 and died in the year 1574. He was among the first of the Scottish nobility to embrace the principles of the Reformation. In 1556 John Knox dispensed the Sacrament of the Lord's Supper to this Earl, his family, and some friends, at Finlayston, under the venerable Yew-tree already referred to. An old chronicler states that "There were no cups of the proper sort for holding the sacramental wine, and in the emergency the hollow soles of two silver candle-sticks were used.

These interesting relics were lent for use in the Parish Church of Kilmacolm as long as the Glencairn family remained at Finlayston, and were much esteemed on account of their antiquity and history. When the family left in 1796 the Countess presented four copper cups gilt to the Parish Church, and took the venerated candle-sticks with her."

James, fourteenth Earl, was born in 1749, succeeded his father in 1775, and died at Falmouth in 1791, when in the 42nd year of his age. He deserves to be kept in remembrance as the friend and benefactor of our Scottish bard, Robert Burns.

No flowering-plants of special interest were observed, but several species of Microfungi were noted by Mr. D. A. Boyd.

Mr. John Renwick has submitted the following report on measurements of trees at Finlayston, with notes of previous measurements :—

Fraxinus Ornus, L.

Aug., 1907—Girth 5 ft. $3\frac{1}{2}$ in. at 2 ft. ; bole 5 ft.

Ulmus montana, With.

Dec., 1899—Girth 13 ft. $1\frac{1}{2}$ in. at 5 ft. ; bole 8 ft. ; height 83 ft.

Aug., 1907—Girth 13 ft. $3\frac{1}{2}$ ins. at 5 ft. ; rate of increase in girth $\frac{2}{7\cdot75} = \cdot26$ in.

Quercus Cerris, L.

May, 1889—Girth 11 ft. 7 in. ; spread 96 ft.

Oct., 1893—Girth 11 ft. 9 in. at 3 ft. 4 in. ; bole 10 ft.

Dec., 1899—Girth 12 ft. 2 in. at 3 ft. 4 in. ; height 58 ft. ; spread $97\frac{1}{2}$ ft. ; rate of increase in girth $\frac{5}{6} = \cdot83$ in.

Aug., 1907—13 ft. 2 in. at 3 ft. 4 in. ; rate of increase $\frac{12}{7\cdot75} = 1\cdot55$ in.

Castanea sativa, Mill., var. *heterophylla*.

Aug., 1907—Girth 10 ft. 8 in. at 5 ft. ; bole 18 ft. ; height 67 ft.

Fagus sylvatica, L.

Dec., 1899—Girth 12 ft. 4 in. at 5 ft. ; bole 30 ft.

Aug., 1907—Girth 12 ft. 6 in. at 5 ft. ; rate of increase $\frac{2}{7\cdot75} = \cdot26$ in.

Taxus baccata, L.—Three Yews in "Paradise."

Western tree—Female.

Oct., 1893—Girth 9 ft. 1 in. at 1 ft. 6 in.; bole 4 ft.

Dec., 1899—Girth 9 ft. $3\frac{1}{4}$ in. at 1 ft. 6 in.; height 38 ft.; rate of increase $\frac{2\cdot25}{6\cdot1} = \cdot37$ in.

Aug., 1907—Girth 9 ft $5\frac{1}{2}$ in. at 1 ft. 6 in.; rate of increase $\begin{cases} \frac{2\cdot25}{7\cdot75} = \cdot30 \text{ in.} \\ \frac{4\cdot50}{13\cdot85} = \cdot32 \text{ in.} \end{cases}$

Eastern tree—Male.

Oct., 1893—Girth 8 ft. $10\frac{3}{4}$ in. at 2 ft.; bole 4 ft.

Dec., 1899—Girth 9 ft. $3\frac{1}{2}$ in. at 2 ft.; rate of increase $\frac{4\cdot75}{6\cdot1} = \cdot76$ in.

Aug., 1907—Girth 9 ft. $7\frac{1}{2}$ in. at 2 ft.; rate of increase $\begin{cases} \frac{4}{7\cdot75} = \cdot52 \text{ in.} \\ \frac{8\cdot75}{13\cdot85} = \cdot63 \text{ in.} \end{cases}$

Southern tree—Male.

Oct., 1893—Girth 8 ft. at 1 ft. 9 in.

Dec., 1899—Girth 8 ft. $1\frac{1}{2}$ in. at 1 ft. 9 in.; rate of increase $\frac{1\cdot50}{6\cdot1} = \cdot24$ in.

Aug., 1907—Girth 8 ft. 5 in. at 1 ft. 9 in.; rate of increase $\begin{cases} \frac{3\cdot50}{7\cdot75} = \cdot45 \text{ in.} \\ \frac{5}{13\cdot85} = \cdot36 \text{ in.} \end{cases}$

Cedrus Libani, Barrel.

May, 1889—Girth 7 ft. 9 in. at ground (narrowest).

Dec., 1899—Girth 8 ft. $6\frac{3}{4}$ in. at ground; height 46 ft.; spread $47\frac{1}{2}$ ft.; rate of increase $\frac{9\cdot75}{10\cdot7} = \cdot91$ in.

Aug., 1907—Girth 9 ft. 3 in. at ground; rate of increase $\begin{cases} \frac{8\cdot25}{7\cdot75} = 1\cdot06 \text{ in.} \\ \frac{18}{18\cdot45} = \cdot97 \text{ in.} \end{cases}$

The Turkey Oak (*Quercus Cerris*) is the largest we know of in the West of Scotland, and probably the largest in Scotland. Dr. A. Henry, F.L.S., who is now Reader in Forestry in Cambridge University, knows of none so good in Scotland, and very few larger in England, where there are specimens up to

15 ft. in girth and 100 ft. in height. The variety *heterophylla* of *Castanea sativa* appears to be rare on a big tree as a sport. This is the first specimen we have met with. It was also new to Mr. Whitton, and to Mr. Goldring, the landscape gardener who has designed the alterations in the grounds at Finlayston.

Glen Douglas, 24th August, 1907.—Mr. Archibald Park, conductor.—This excursion, which was arranged jointly with the Geological Society of Glasgow, took place during favourable weather, and was attended by a party of thirty, ten of whom were members of this society. By special arrangement, the party were allowed to leave the train at Glen Douglas Passing-place, so as to obtain ready access to the head of the valley.

Glen Douglas is supposed to have existed as a very old river valley prior to the formation of Loch Long and Loch Lomond. It is believed that at that period the water-shed was further west than in more recent times, and that the river had its course through Coilessan Glen to Glen Douglas and onward to the Forth. At a later period the valley was deepened by ice-action, as is evidenced by the moraines visible in the glen. Subsequent to the ice age, a barrier to the course of the river was created by deposits of moraine matter, which were probably carried down from the valley on the north side of the glen at Invergroin. A small loch was thus formed, which was afterwards drained as the river gradually cut its way through the obstruction, and the glen assumed its present form. The prevailing rock is mica-schist. No granite is seen *in situ;* a large boulder visible in the glen appears to have been carried by ice from the hills between Glen Falloch and Glen Fyne. A scar on the face of the cliffs on Tullich Hill, on the north side of Glen Douglas, and a considerable heap of debris near the foot of the hill, bear evidence to a land-slip which has occurred subsequent to the ice period.*

The Mosses and Microfungi observed in the glen were reported on by Messrs. John R. Lee and D. A. Boyd respectively.

Montgreenan, 21st September, 1907; Craigends, 5th October, 1907; and Erskine, 12th October, 1907.—Mr. R. B. Johnstone, conductor.

*(See *Transactions Nat. Hist. Soc. of Glasgow*, v. 283.)

These three excursions took the form of Fungus Forays, and were arranged jointly with the Andersonian Naturalists' Society. The attendance at Montgreenan was 13, and at Craigends 21.

In submitting a report on the Hymenomycetes and Gastromycetes observed at Montgreenan and Craigends, Mr. Johnstone stated that the display of fungi in both places was remarkably poor; and this remark applied also to other places not only in Scotland but in England. The unfavourable weather conditions which prevailed during the summer were no doubt responsible for this. Mr. Johnstone's list enumerated 66 species, whereof 26 were found at Montgreenan, 24 at Craigends, and 16 in both localities. The most notable species observed at Montgreenan were *Mycena capillaris*, Fr., *Omphalia fibula*, Bull., *Pleurotus porrigens*, Pers., *Pholiota spectabilis*, Fr., *Lactarius torminosus*, Fr., *Cantharellus tubæformis*, Fr., *Thelephora anthocephala*, Fr.; and at Craigends, *Tricholoma resplendens*, Fr., *Pleurotus mitis*, Pers., *Nolanea pisciodora*, Ces., *Flammula sapinea*, Fr., *Solenia anomala*, Fr., and *Sphærobolus stellatus*, Tode.

The Microfungi noted at Montgreenan, Craigends, and Erskine, are separately reported on.

Dunure, 30th September, 1907.—Mr. John Smith, conductor.—Attention was mainly directed to the rocks along the shore. At one part of the coast where the cliffs are high and perpendicular, a large colony of Swallows built their nests last summer. On 20th July, the birds were very lively, and apparently feeding their young; but at the date of the excursion all was silent, the swallows having migrated to a warmer climate. The nests, however, were still visible in abundance, and it would be difficult to find anywhere a more suitable place for them. With the exception of a few common species, nearly all the plants seen were out of flower. In their season, however, various interesting species occur at Dunure, such as *Scilla verna*, Huds. (which reaches here its northern limit on the Ayrshire coast), *Geranium sanguineum*, L., *Trifolium arvense*, L., *T. striatum*, L., *Sedum roseum*, Scop., *Eupatorium cannabinum*, L., &c.

Calder Glen (Lochwinnoch), 11th April, 1908.—Mr. John R. Lee, Conductor.—This excursion was held jointly with the Andersonian Naturalists' Society. The total attendance was

sixteen, six of whom were members of both societies. In the glen the left bank of the Calder was followed to a point a little below the waterfall. The return was made by the road to Lochwinnoch, and some of the party afterwards visited the shores of Castle-Semple Loch.

Owing to the backwardness of the season, Flowering-plants were not conspicuous; but as the glen is a rich one for Mosses, the botanist members of the party found plenty of material for the study of bryology. Most time was spent in an examination of the moss-covered banks and rocks along the edge of the old mill-lade in the lower part of the glen, as, owing to the cloudy sky, the more densely-wooded portions further up the glen were enveloped in semi-darkness.

With regard to ornithology, Mr. Ross reported that 34 species of Birds were noted, inclusive of those seen on Castle-Semple Loch. No summer visitors were among the species observed. The Fieldfare was seen near the head of the glen; about the marshy ground at the side of the loch many Meadow Pipits were in song; while in the water were the Mallard, Teal, Widgeon, Pochard, and Tufted Duck. A small flock of Golden Plovers were seen to fly over the loch, uttering their call.

Reports on the Mosses and Hepatics of the glen were submitted by Mr. Lee, and on the Microfungi by Mr. Boyd.

Arran, 20th April, 1908.—Mr. J. W. Reoch, conductor.—This excursion was arranged jointly with the Geological Society of Glasgow, and attended by a party of nineteen. From Brodick Pier the direction taken was eastward along the Corriegills Shore to Clauchland Point, thence up the ridge of the Clauchland Hills *via* Dun Fionn and Dun Dubh, and thence back to Brodick by road.

The old sea-beach is a marked feature on this part of the coast, as it also is around nearly the whole circumference of the island. Here it forms a broad platform backed by cliffs inland. The pools on the foreshore teem with life, and the botany of the marshy platform and the cliffs behind is rich.

The sedimentary rocks exposed along the shore are alternating sandstones and conglomerates of Lower Triassic age, with a general southerly dip, and they afford throughout the entire route

excellent sections for geological study. Faults are seen to traverse the rocky platform in all directions, and varying in throw from a fraction of an inch to hundreds of feet. Fine examples of current bedding are to be seen both on the shore and the cliff section. The rocky platform is also intersected by very numerous dykes and by sills of igneous rocks, as many as sixty dykes having been counted between Brodick and Clauchland Point. Many travelled boulders strew the beach, more especially boulders of granite, which have evidently been borne by the agency of ice from the area of the intrusive granite of the interior of the island. One of these, near Corriegills, is of enormous size, and its weight has been estimated at over two hundred tons. The bay at Corriegills is crowded with these boulders, and this would appear to be the spot where the ice which bore them from their home in the neighbourhood of Goatfell, had finally melted and left them stranded. Further on, upon the shore beneath Dun Fionn, and associated with a sill of felsite, occurs a vein of pitchstone exhibiting a beautiful spherulitic structure. The red sandstone on the shore here weathers very prettily into honey-comb-like forms, slabs of which are often used for decorative purposes in the gardens of neighbouring cottages, nature's handiwork thus being recognised in preference to artful ornament. On a higher horizon on the north face of Dun Fionn there occurs a large sill of pitchstone—the so-called "bottle rock" of the natives—which has been intruded among the sedimentary rocks. The ridge of the Clauchland Hills, here some 600 ft. above the shore, is capped by a sill of dolerite showing rude columnar structure, and the beach below is strewn with huge masses of the columns which have fallen from the cliffs above. The dolerite runs out to sea near Clauchland Point, and its junction with the sandstone is well shown on the beach. The sandstone has been much indurated at the point of contact, and changed into a quartzite. An easy ascent westward along the ridge of the Clauchland Hills brought the party to Dun Fionn, from which was obtained a most imposing view, extending from the mountains of the Western Highlands to the southern extremity of the Ayrshire coast.

Mr. D. A. Boyd spent some time in exploring the woods and cliffs along the shore between Invercloy and Corriegills, where he noted thirty-six species of Microfungi. Amongst these were

several rare or notable forms, such as *Puccinia umbilici*, Guép., *Ephelina prunellæ*, Phil., *Stictis stellata*, Wallr., *Orbilia marina* (Phil.), &c.

Campsie Glen, 9th May, 1908.—Mr. Alexander Ross, conductor.—This excursion was taken part in by thirteen members and friends. From Lennoxtown Railway Station the party proceeded along the "Crow Road," which winds upward from the base of the Campsie Hills and passes onward across the moorlands towards Fintry. Favourable atmospheric conditions enabled the beauty of the landscape to be fully appreciated. Vegetation was found to be somewhat backward for the time of year, but on the way a number of common plants in flower were noted. Amongst the boulders near "Wright's Well," an unsuccessful search was made for the Parsley Fern, formerly reported to occur at that place. From the bridge across the Glazert, some distance above the falls, the party descended the glen. The flowering-plants seen in bloom were not numerous; and amongst those observed the most prominent were the Wood-Anemone, Marsh Marigold, Opposite-leaved Golden-Saxifrage, Wood Sorrel, Ground Ivy, Dog's Mercury, and Great Hairy Wood-rush. The flowers of the Elm, catkins of the Hazel, and opening foliage of the trees, imparted an element of freshness and beauty to the wooded banks of the stream. At the bottom of the glen, attention was directed to some fine Beech trees, which, according to tradition, were planted to commemorate the Union of the Scottish and English Crowns in 1603.

Birds were not numerous, although twenty-eight species were seen. A pair of Grey-Wagtails were observed in the glen, and a good view of a Dipper was obtained while the bird sat on a boulder in the middle of the stream. Only three summer migrants—the Willow Wren, Swallow, and Common Sandpiper—were seen; and one of the party, who had visited the glen earlier in the day, heard the note of the Cuckoo.

Numerous Microfungi were noted, of which the most important were several fully-developed ascophores of *Sclerotinia baccarum*, Rehm, never before observed in that condition in Britain.

Balmaha to Rowardennan, 21st May, 1908.—Mr. James Pottie, conductor.

This excursion was arranged jointly with the Andersonian Naturalists' Society, and took place during very favourable weather. The attendance numbered thirty-two.

The party travelled by rail from Glasgow to Balloch Pier, and by steamer on Loch Lomond from Balloch to Balmaha. On emerging from the Pass of Balmaha and proceeding downhill, beautiful glimpses were obtained of the sparkling waters of the loch bordered with softest green; while far ahead towered Ben Lomond and other lofty mountains, some of which still showed traces of wintry cold in the snow which lay in their gullies. The walk along the side of the loch towards Rowardennan was greatly enjoyed

It was reported by Mr. Alexander Ross that thirty-seven species of Birds had been observed, of which eleven were summer migrants. A short distance from Balmaha, several Redstarts were seen flitting about among the branches of trees near the roadway. The Cuckoo was both heard and seen; the Willow Wren was frequently noticed during the course of the walk; and the "shivering" notes of the Wood Wren were occasionally listened to. The Spotted Flycatcher was observed at intervals, and a pair appeared to be nesting in a hole in an ash-tree at Tigh-an-Laoigh. Tree-Pipits were common, and the Common Sandpiper was seen on the margin of the loch.

Reptiles were represented by an Adder, about eighteen inches in length, which would not wait for an interview, but darted into a clump of withered bracken, where it was lost to vision; and by the Common Newt, which was observed in a pool near Rowardennan Hotel.

Mr. Ross also reported that a considerable number of Diptera had been taken, of which the Tipulidæ alone had as yet been identified. Insects of this group, however, were disappointingly scarce. The only species met with in abundance was *Amalopsis immaculata*, Mg., while of *Tipula oleracea*, L., usually a very common species, one specimen only was seen. Among other species netted were *Limnobia nubeculosa*, Mg., *Dicranomyia chorea*, Mg., *Empeda nubila*, Schum., *Goniomyia* sp. (a dark species), *Erioptera trivialis*, Mg., *Idioptera pulchella*, Mg., and *Amalopsis unicolor*, Schum.

Eighty-two species of Flowering-plants were noted, but none of these calls for special mention. Of the Mosses observed

by Mr. J. R. Lee, the most notable species was *Bryum roseum*, Schreb.

Among the Algæ noted by Mr. George Lunam, reference may be made to *Batrachospermum moniliforme*, Roth, which was so abundant as to cover many of the rocks in the streams, and to *Draparnaldia plumosa*, Vauch., *D. glomerata*, Ag., and *Tetrasporu gelatinosa*, Desv., which were also plentiful.

Fungi were investigated by Mr. R. B. Johnstone, who obtained a few of the larger forms, including *Coprinus plicatilis*, Fr., *Polyporus squamosus*, Fr., *Mitrula phalloides* (Bull.) Chev., &c.

Braidwood to Tillietudlem, 6th June, 1908.—Mr. John Robertson, conductor. In brilliant weather six members proceeded by rail to Braidwood Station. The route taken was down alongside Fiddler Gill, and through the orchards to Crossford, where a halt was made for tea. The road by the Nethan was afterwards followed to Craignethan Castle and Tillietudlem railway station.

As time only permitted a pleasant ramble, little of note was observed. Only four birds' nests—two Blackbirds and two Whitethroats—were seen. The Mistle Thrush was heard in full song. This was a point of some interest, as the conductor had never before heard the spring notes of that bird so late as the 6th of June.

Among Flowering-plants, mention may be made of *Paris quadrifolia*, L., and *Neottia Nidus-avis*, Rich., both seen in Fiddler Gill; and of *Ranunculus bulbosus*, L., *Cheiranthus Cheiri*, L., and *Arum maculatum*, L., observed at Craignethan Castle.

Rosneath, 27th June, 1908.—Report by Mr. John Renwick. In the little glen near the pier, patches of Heart-leaved Valerian (*Valeriana pyrenaica*, L.) and Orpine (*Sedum Telephium*, L.) were seen. The grounds of the Clachan House were visited, to see the famous triple avenue of Yews, Limes, &c. The largest Yew (*Taxus baccata*, L.), a female, has a bole of 10 feet, and a girth of 12 ft. 2 in. at 2 ft. 6 in. up, showing an increase in girth since 1895 of $9\frac{1}{4}$ in., an average of about $\frac{7}{10}$ in. yearly, which is a considerable growth for a Yew-tree. The largest Lime (*Tilia vulgaris*, Hayne) has a bole of 9 ft., and a girth of 14 ft. $3\frac{1}{2}$ in.

at 4 ft. 6 in.; but this is not all solid trunk, as there is a projecting pillar or buttress. The best Sweet Chestnut (*Castanea sativa*, Mill.) has a bole of 30 ft., and girths 13 ft. 10 in. at 5 ft. 9 in., showing an increase of 11 in. since 1895, an average of ·8 in. yearly. Another Chestnut, nearly as fine, has been cut down since 1903. It then measured 13 ft. 2 in. at 5 ft.; bole 30 ft. At the south end of the avenue, and on the side of the Clachan Burn, is a good Sycamore (*Acer Pseudo-platanus*, L.), with a bole of 12 ft., and a girth of 13 ft. 11½ in. at 4 ft. 9 in.

The house at the Kirkton of Rosneath is said to have been built, and the avenue planted, by the Hon. John Campbell of Mamore, second son of the 9th Earl of Argyll. If so, the Yews at least are about 200 years old. The house, which had become somewhat dilapidated, has recently been renovated that it may be let. There is a tradition that a monastery once existed on this spot.

The celebrated Silver Firs (*Abies pectinata*, DC.) at Camsail were next visited. They are supposed to be the largest in Great Britain. One girths 22 ft. 4½ in. at 4 ft. 6 in., and has a height of 118 ft.; the other is 21 ft. 9½ in. at 4 ft. 6 in., height 123 ft. These girth measurements are each taken at the narrowest part of the trunk, and represent good solid wood, so far as can been seen. At any other point within reach, a considerably larger girth would be obtained. Neither of the trees has increased much recently, and their best days would seem to be past. Comparing them with the Silver Firs of known age at Auchendrane, one would conjecture that these trees are at least 270 years old. On the path leading to these giants are a number of Silver Firs, two of which were found to girth 15 ft. 11 in. and 14 ft. 6¾ in. at 5 ft.—very good trees, but seeming only infants in comparison with the venerable "Adam" and "Eve." The grounds of Rosneath Castle are well wooded, and show good specimens of Beech, Scots Fir, &c.

The Castle was built in 1803, shortly after the destruction by fire of the older mansion, which was situated near the shore. The Castle of Rosneath is believed to have existed as a royal fortress before the end of the twelfth century, and to have been destroyed by Wallace some time about 1297. Tradition has it that he was on one occasion closely pursued by his enemies here.

and only escaped by jumping over the old sea-cliff, about 30 feet high. His horse was killed, but he got safely off, and swam across the Gareloch to Cairndhu Point. The spot is still known as "Wallace's Leap," and, if any one doubts the story, he can go and see it!

About a mile from the Castle is the Heronry, but time did not permit of its being visited.

It is well known that Sir Walter Scott, in the *Heart of Midlothian*, called Rosneath an island, and has often been laughed at for doing so; but Joseph Irving and other writers state that in common parlance it is described as "the island." The parish up till 1643 included a large part of the present parish of Row, and was called "the parochin within and without the isle." The lands of Mamore, Mambeg, and Fernicarry passed in 1545 from Colquhoun of Luss to James Campbell of Ardkinglass, who sold them in 1568 to the Earl of Argyll. In the protocol relating to the latter transactions it is written, "and that becaus the said earl seized the said James and his heirs male in the lands of Litilros, ... in the lands of Mekill Rois, and lands of Portkill . . . . lying in the island of Roisneth, with the office of bailiary of the whole island of Roisneth." Therefore, instead of Sir Walter showing ignorance, he may have shown local knowledge exceeding that of his critics!

The spelling of the place-name varies, as was the custom in olden days. In this protocol it is "Roisneth;" in the *Register of Passelet* (Paisley) it is "Neueth," "Neyt," "Rosneth," and "Rusnith;" and in the *Cartulariam de Levenax* it is "Reynt" and "Rosneth." But it is never "Roseneath," which is quite modern and evidently erroneous. The first syllable has nothing to do with roses, but is the Gaelic "Ross," a point; and the name may mean "the bare or unwooded promontory," or "the promontory of the Virgin," or "the promontory of the sanctuary," from the tradition that there was an early church situated here dedicated to the Virgin.

Ben Vorlich (Dumbartonshire), 18th July, 1908.—Report by Mr. John R. Lee. This was a joint-excursion with the Andersonian Naturalists' Society, and was attended by a party of six. Owing to the unforeseen and unavoidable absence of the

appointed leader (Mr. R. B. Johnstone), the programme for the day was not fully carried out. Two members of the party had travelled to Arrochar on the previous evening (Friday), and ascended the slope of Ben Narnain for some distance before nightfall, continuing at daybreak the journey up the gully between Ben Narnain and Ben Arthur, and thence to the summit of Ben Ime. They then descended the north-eastern side of the mountain, and followed the stream flowing eastward to the Allt-Coiregrogain, which latter burn was then followed to its junction with the Inveruglas Water. The two members then ascended Ben Vorlich from that point, and kept along the ridge northwards to the summit, which was reached about 2.30 p.m. No sign of the other members of the party being visible, the descent was made towards Ardlui, where the other four were found to have arrived, having just descended from the summit of the "Little Hill," one of the eastern outliers of Ben Vorlich. After tea in Ardlui Hotel, the party returned by rail to the city.

The plants found on Ben Ime included *Cerastium alpinum*, L., *Saxifraga hypnoides*, L., *S. oppositifolia*, L., and *Luzula spicata*, DC., while those observed on Ben Vorlich included *Juncus triglumis*, L., and *J. trifidus*, L. On Ben Vorlich a search was made for *Cornus suecica*, L., previously found on that mountain, but no specimen was observed on this occasion.

Dougalston and Bardowie, 22nd August, 1908.—Mr. John Renwick, conductor.

Dougalston policies, now visited for the third time by the Society, are situated within a mile of the town of Milngavie, and lie in that portion of the parish of East or New Kilpatrick which at one time formed part of Stirlingshire but has now been transferred to Dumbartonshire. The estate formerly belonged to a family of Grahams of the Montrose line; but it was sold in 1767 to John Glassford, an eminent Glasgow merchant, after whom Glassford Street was named, and in whose mansion of Shawfield Prince Charlie held his court during his flying visit to our city in 1745. Mr. Glassford is mentioned by Smollet in *Humphrey Clinker*. His tombstone may be seen and read from the street at the south-west corner of the Ramshorn (St. David's) Churchyard. The estate was sold nearly forty years ago, when

it was purchased by Mr. Robert Ker, merchant in Glasgow, father of the present proprietor, Mr. T. R. Ker, who erected the existing mansion.

To the north of the house is a pretty piece of woodland, in which were noticed, among others, some varieties of *Acer*; a beautiful Birch, 65 ft. in height, and 4 ft. $6\frac{3}{4}$ in. in girth at 5 ft. up; and a specimen of *Cotoneaster frigida*, Wall., a sub-evergreen tree, which Mr. Whitton states is proving an excellent town-tree, and has been planted freely in Ruchill Park.

The fine Beech near the house appears to be in good condition. Its girth at 4 ft. is 17 ft. 8 in., showing an increase of 9 in. since 1893; average ·57 in. per annum. At 6 ft. 8 in. up, clear of the swell of the roots, it is 16 ft. $4\frac{1}{2}$ in.; increase $10\frac{1}{2}$ in; average ·66 in. The growth between 1893 and 1900 appears to have been greater than that between 1900 and 1908. It is a well-grown park-tree with a good spread of branches: 39 ft. to S., $50\frac{1}{2}$ ft. to N. = $89\frac{1}{2}$ ft.; $41\frac{1}{2}$ ft. to E., $45\frac{1}{2}$ ft. to W. = 87.

A Yew tree behind the house has a girth of 12 ft 3 in. at the base; but as the ground may have again been raised since our first visit, the apparent increase of 7 ins. cannot be taken as all representing actual growth.

To the south of the house is an Oak 12 ft. in girth at 3 ft. 6 in., showing an increase of 3 in. since 1900 = $\frac{1}{3}$ in. per annum.

In the pond called the Lady Loch, *Typha latifolia*, L., and *T. angustifolia*, L., were growing; and among other plants observed were *Lythrum Salicaria*, L., *Lycopus europæus*, L., and *Epipactis latifolia*, All.

Making their way through the fields by the side of the sluggish burn which flows from Bardowie Loch to Dougalston Loch and thence to the Allander, the party arrived at the former sheet of water. It lies in a hollow in the boulder clay. The out-flowing burn goes through peaty or marshy ground which has no doubt grown upon the clay. Bardowie Loch has a length of half-a-mile (2,600 ft.), and a breadth of 1,150 ft. near the foot. Its greatest depth is stated by Mr. Dron to be 35 ft. Its height above sea-level is 126 ft., which seems to be a little above the level of the lake that after the glacial period would occupy the valley of the Kelvin, before the high ground near Maryhill was cut through by

the river. The present course of the Kelvin from a little above Killermont to the Clyde is post-glacial. A buried river-channel runs by Millichen, Kilmardinny, Garscadden, and Drumry, and is now filled up with sand, gravel, mud, clay, etc., to a depth in some places of over 400 ft. This hollow is about 230 ft. below the present sea-level, and when it was excavated by the old river, the land would likely stand, relatively to the sea, at least 600 ft. higher than it does now. The valleys of Loch Long and Loch Lomond would not then be formed, and the course of the river would be by Loch Goil and the Gareloch, on to the Forth, to join the northern extension of the Rhine.

The ground around Bardowie Loch rises rather steeply, and as nearly half the circuit of the lake is covered with wood, the scenery is varied and rather attractive. There is an old tower or castle on the north side of the loch, let to Mr. Anderson, who kindly gave permission to pass through the grounds attached to the castle. The estate now belongs to a Glasgow company who are feuing that part which occupies the slope descending to the Kelvin. By the kindness of Mr. R. W. Dron, engineer to the company, a boat was placed at the disposal of the party, a few of whom had a row on the loch, and obtained specimens of the White Water-Lily (*Castalia speciosa*, Salisb.), which grows freely near the foot of the lake.

On the way to the station recently opened at Bardowie on the Kelvin Valley Railway, Gold-of-pleasure (*Camelina sativa*, Crantz) was found. The low ground, between the station and the sloping ground forming the edge of the valley, is being filled up with all sorts of rubbish; and, as there seemed a prospect of other strangers being found, two members revisited the place a few weeks later. The characteristic of the vegetation was the luxurious growth of nearly all the plants. There was still room for the population; the struggle with each other for existence had barely begun. The narrow-leaved Orache (*Atriplex angustifolia*, Sm.) grew tall, stout, and spreading; the Wild Carrot (*Daucus Carota*, L.) was suggestive of plants in a vegetable market-garden; the Slender Tare (*Vicia tetrasperma*, Mœnch) made up for the weakness of its stems by their length and tangledness, and for the smallness of its flowers and pods by their number; *Senecio viscosus*, L., was in moderate abundance,

as if the ground was a little too good for it; while the White Campion (*Lychnis alba*, Mill.) and Corn Blue-bottle (*Centaurea Cyanus*, L.) afforded an occasional and pleasant change of colour.

As a further supplement to the Society's excursion, the fine Elm trees in the churchyard of Baldernock were visited, and their measurements compared with those obtained in 1893. It was found that the tree to the east had increased in girth $6\frac{3}{4}$ in., showing an average of ·42 in. per annum; while the tree in the south-west corner had increased 6 in., = ·38 in. per annum. The measurements are as follows:—

East tree—girth 13 ft. 1 in. at 3 ft. 6 in.; bole 17 ft.; height in 1899, 83 ft.

S.-W. tree—girth 13 ft. 9 in. at 4 ft. 10 in.; bole 10 feet; height in 1899, 82 ft.

Height above sea-level, 300 ft.

Mr Alexander Ross reports that the Diptera captured at Bardowie included the following species:—*Trichocera fuscata*, Mg., *T. hiemalis*, Deg., *T. regelationis*, L., *Tipula pagana*, Mg., *Dicranomyia modesta*, Mg., *Dixa nebulosa*, Mg., *Helophilus pendulus*, L, *Leptis lineola*, F., *Ocydromia glabricula*, Fln., *Hylemyia strigosa*, Fab., *Azelia cilipes*, Hal., and *Sepsis cynipsea*, L.

Among the Microfungi noted, the most interesting species was *Pseudopeziza alismatis* (Phil. & Trail) Sacc., obtained on leaves of *Alisma Plantago-aquatica*, L., at the Lady Loch, Dougalston.

Supplementary Report on Mosses, Hepatics, and Microfungi observed at Excursions.

At various Excursions in 1907 and 1908, lists of the Mosses, Hepatics, and Microfungi seen were carefully compiled. These have been incorporated in the following Supplementary Report,

which consists of the lists relating to the Excursions after mentioned, viz :—

AYRSHIRE—

1. Auchans and Dundonald, 1st June, 1907 ;
2. Montgreenan, 21st September, 1907 ;

RENFREWSHIRE—

3. Lochwinnoch, 13th April, 1907 ;
4. Finlayston, 10th August, 1907 ;
5. Craigends, 5th October, 1907 ;
6. Erskine, 12th October, 1907 ;
7. Calder Glen (Lochwinnoch), 11th April, 1908 ;

LANARKSHIRE—

8. Calderwood Glen, 27th April, 1907 ;
9. Cartland Crags, 18th May, 1907 ;
10. Monkland and Woodhall, 22nd June, 1907 ;

STIRLINGSHIRE—

11. Campsie Glen, 9th May, 1908 ;
12. Balmaha to Rowardennan, 21st May, 1908 ;
13. Bardowie, 22nd August, 1908 ;

ARGYLLSHIRE—

14. Loch Riddon, 23rd May, 1908 ;

DUMBARTONSHIRE—

15. Glen Douglas, 24th August, 1907 ;
16. Rosneath, 27th June, 1908 ;
17. Dougalston, 22nd August, 1908 ;

BUTESHIRE—

18. South Bute, 1st April, 1907 ;
19. Arran, 20th April, 1908.

The Mosses observed at Excursions Nos. 1, 4, 9, 16, have been reported on by Mr. D. A. Boyd ; at No. 3, by Mr. Charles Scott ; and at Nos. 7, 8, 12, 14, and 15, by Mr. John R. Lee.

The Hepatics observed at Excursions Nos. 7, 8, and 14, have been reported on by Mr. John R. Lee.

The Microfungi observed at Excursions Nos. 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 13, 14, 15, 16, 17, 18, and 19, have been reported on by Mr. D. A. Boyd.

Musci.

Tetraphis pellucida, Hedw.—14.
Polytrichum aloides, Hedw.—3, 12.
P. urnigerum, L.—7.
P. piliferum, Schreb.—7, 12.
P. juniperinum, Willd.—3, 12.
P. formosum, Hedw.—8.
P. commune, L.—3, 12.
Ditrichum homomallum, Hampe.—14.
Ceratodon purpureus, Brid.—3.
Dichodontium pellucidum, Schp.—3.
Dicranella heteromalla, Schp.—14.
Dicranoweisia cirrata, Lindb.—7.
Campylopus flexuosus, Brid.—14.
C. fragilis, B. & S.—7, 12.
C. atrovirens, De Not.—12.
Dicranum scoparium, Hedw.—3, 7.
Leucobryum glaucum, Schp.—7.
Fissidens bryoides, Hedw.—3, 7.
F. adiantoides, Hedw.—7.
F. taxifolius, Hedw.—7.
Grimmia apocarpa, Hedw.—3, 7.
v. rivularis, W. & M.—3.
Rhacomitrium aciculare, Brid.—3.
Rh. protensum, Braun.—14.
Rh. fasciculare, Brid.—3.
Rh. heterostichum, Brid.—7.
Ptychomitrium polyphyllum, Fürnr.—14.
Hedwigia ciliata, Ehrh.—12.
Tortula muralis, Hedw.—3.
T. lævipila, Schwæg.—1, 16.
T. ruralis, Ehrh.—9.
Barbula rubella, Mitt.—3.
B. rigidula, Mitt.—3.
B. revoluta, Brid.—3.
B. unguiculata, Hedw.—3, 7.
Weisia viridula, Hedw.—3.
W. curvirostris, C.M.—8.
Cinclidotus fontinaloides, P. Beauv.—3.
Encalypta streptocarpa, Hedw.—3, 7, 14.
Anœctangium compactum, Schwæg.—15.
Zygodon Mougeotii, B. & S.—7.
Z. viridissimus, R. Brown.—1, 14.
Ulota Bruchii, Hornsch.—3.
U. crispa, Brid.—7.
U. phyllantha, Brid.—12, 14.
Orthotrichum leiocarpum, B. & S.—14, 15.
O. Lyellii, Hook. & Tayl.—12.
O. affine, Schrad.—12.
O. stramineum, Hornsch.—14, 15.
Funaria hygrometrica, Sibth.—3.
Aulacomnium palustre, Schwæg.—3, 12.
Bartramia ithyphylla, Brid.—7.
Webera polymorpha, Schp.—15.
W. elongata, Schwæg.—15.
Bryum cæspiticium, L.—3.
B. capillare, L.—3.
B. roseum, Schreb.—12.
Mnium affine, Bland., v. elatum, B. & S.—3.

M. cuspidatum, Hedw.—3.
M. rostratum, Schrad.—7, 8.
M. undulatum, L.—3, 7.
M. hornum, L.—3, 7.
M. serratum, Schrad.—15.
M. punctatum, L.—7.
Fontinalis antipyretica, L.—3.
Neckera pumila, Hedw.—16.
N. complanata, Hübn.—1 (c. fr.), 8, 12.
Pterygophyllum lucens, Brid. —7.
Pterogonium gracile, Swartz. —12.
Habrodon Notarisii, Schp.—16.
Leskea polycarpa, Ehrh.—3.
Heterocladium heteropterum, B. & S.—7.
Thuidium tamariscinum, B. & S.—7.
Climacium dendroides, W. & M. —3 (c. fr.).
Orthothecium rufescens, B. & S. —15.
Camptothecium sericeum, Kindb.—7.
Brachythecium rutabulum, B. & S.—3, 7.
B. populeum, B. & S.—7.
B. purum, Dixon.—3.
Hyocomium flagellare, B. & S. —7, 14.
Eurhynchium piliferum.—B. & S.—14.
E. prælongum, Hobkirk.—3, 7.
E. myosuroides, Schp.—14.
E. myurum, Dixon.—8.
E. striatum, B. & S.—3.
E. rusciforme, Milde.—3.
E. confertum, Milde.—3.
Plagiothecium elegans, Sull.—3.
P. denticulatum, B. & S.—3, 7.
P. undulatum, B. & S.—3.
Amblystegium serpens, B. & S. —3.
A. fluviatile, B. & S.—3, 4.
A. filicinum, De Not.—12.
Hypnum riparium, L.—3.
H. exannulatum, Gümb.—12.
H. uncinatum, Hedw.—3, 7, 8.
H. commutatum, Hedw.—8.
H. cupressiforme, L.—7.
v. resupinatum, Schp.—3.
v. filiforme, Brid.—3.
H. Patientiæ, Lindb.—3, 7.
H. callichroum, Brid.—14, 15.
H. molluscum, Hedw.—14.
H. eugyrium, Schp.—14.
H. cordifolium, Hedw.—3 (c. fr.).
H. giganteum, Schp.—3.
H. cuspidatum, L.—3, 14.
H. Schreberi, Willd.—3, 7, 9 (c. fr.).
Hylocomium splendens, B. & S. —3, 7.
H. brevirostre, B. & S.—9.
H. squarrosum, B. & S.—3.
H. triquetrum, B. & S.—3.

Hepaticæ.

Conocephalus conicus (L.) Dum. —7.
Metzgeria furcata (L.) Lindb. —14.

M. conjugata, Lindb.—7, 14.
M. hamata, Lindb.—14.
Pellia epiphylla (L.) Dum.—7.
Aplozia crenulata (Sm.) Dum. —7.
Saccogyna viticulosa (Sm.) Dum.—7.
Calypogeia trichomanis (L.) Corda.—14.
Lepidozia Pearsoni, Spruce.—14.
Diplophyllum albicans (L.) Dum.—7.
Madotheca platyphylla (L.) Dum.—7.
Lejeunea cavifolia (Ehrh.) Lindb.—7.
Frullania Tamarisci (L.) Dum. —14.

Fungi.

Synchytrium taraxaci, De Bary & Wor.—On *Taraxacum officinale;* 1, 16.
S. mercurialis, Lib.—On *Mercurialis perennis;* 11, 19.
S. succisæ, De Bary & Wor.—On *Scabiosa succisa;* 15.
Protomyces macrosporus, Ung.—On *Ægopodium Podagraria;* 1, 2, 5, 10, 11, 16.
P. pachydermus, Thüm.—On *Taraxacum officinale;* 5.
Spinellus fusiger (Link) Van Tiegh.—On rotten agarics; 2.
Cystopus candidus (Pers.) Lév.—On *Capsella Bursa-Pastoris;* 17.
Plasmopara nivea (Ung.) Schröt.—On *Ægopodium Podagraria;* 1, 2. On *Anthriscus sylvestris;* 1, 9.
P. pygmæa (Unger) Schröt.—On *Anemone nemorosa;* 1, 9.
Peronospora calotheca, De Bary.—On *Galium Aparine;* 2.
P. ficariæ, Tul.—On *Ranunculus Ficaria;* 9, 11. On *R. repens;* 11, 16.
P. grisea (Ung.) De Bary.—On *Veronica Beccabunga;* 1, 13.
P. alta, Fckl.—On *Plantago major;* 1.
Ustilago longissima (Sow.) Tul.—On *Glyceria fluitans;* 13.
Tilletia decipiens (Pers.) Winter.—On *Agrostis vulgaris;* 17.
Urocystis anemones (Pers.) Winter.—On *Ranunculus repens;* 2, 16, 17.
Entyloma Fergussoni (B. & Br.) Plow.—On *Myosotis arvensis;* 16.
E. ranunculi (Bon.) Winter.—On *Ranunculus Ficaria;* 1, 9, 11.
E. microsporum (Ung.) Schröt.—On *R. repens;* 2, 4, 6, 11.
Uromyces limonii (DC.) Winter.—As Æcidium on *Armeria maritima;* 19.
U. polygoni (Pers.) Fckl.—As Uredo on *Polygonum aviculare;* 13, 17.

U. geranii (DC.) Winter.—As Æcidium on *Geranium sylvaticum;* 9.

U. poæ, Rabh.—As Æcidium on *Ranunculus Ficaria;* 1, 9.

U. rumicis (Schum.) Winter.—As Uredo on *Rumex obtusifolius;* 4, 16. On *R. Acetosa;* 15, 16.

U. alchemillæ (Pers.) Winter.—On *Alchemilla vulgaris;* 1, 3, 9, 10, 16, 17.

U. ficariæ (Schum.) Winter.—On *Ranunculus Ficaria;* 1, 7, 9, 19.

U. scillarum (Grev.) Winter.—On *Scilla festalis;* 9.

Puccinia lapsanæ (Schultz) Plow.—On *Lapsana communis;* 3, 5. On *Crepis paludosa;* 16.

P. violæ (Schum.) Winter.—On *Viola Riviniana;* 2, 9.

P. menthæ, Pers.—As Uredo on *Mentha aquatica;* 13.

P. saniculæ, Grev.—On *Sanicula europæa;* 19.

P. rubigo-vera (DC.) Winter.—As Uredo on *Holcus,* &c.; 13.

P. poarum, Nielsen.—As Æcidium on *Tussilago Farfara;* 2, 5, 10, 13.

P. obtegens, Tul.—On *Cnicus pratensis;* 1, 4.

P. centaureæ, Mart.—On *Centaurea nigra;* 17.

P. taraxaci, Plow.—As Uredo on *Taraxacum officinale;* 9.

P. oblongata (Link) Winter.—As Uredo on *Luzula maxima;* 6, 7, 9, 16, 18, 19. On *L. campestris;* 15, 16.

P. Baryi (B. & Br.) Winter.—On *Brachypodium sylvaticum;* 9.

P. ægopodii (Schum.) Winter.—On *Ægopodium Podagraria;* 10.

P. umbilici, Guép.—On *Cotyledon Umbilicus;* 19.

P. bunii (DC.) Winter.—On *Conopodium denudatum;* 7, 9, 11, 19.

P. glomerata, Grev.—On *Senecio vulgaris;* 1, 4.

P. arenariæ (Schum.) Winter.—On *Arenaria trinervia;* 5.

P. valantiæ, Pers.—On *Galium saxatile;* 15.

Triphragmium ulmariæ (Schum.) Winter.—As Uredo on *Spiræa Ulmaria;* 9.

Phragmidium fragariastri (DC.) Schröt.—As Uredo on *Potentilla Fragariastrum;* 9.

Ph. subcorticatum (Schrank) Winter.—On *Rosa;* 2, 9.

Melampsora hypericorum (DC.) Winter.—As Uredo on *Hypericum Androsæmum;* 16.

M. betulina (Pers.) Winter.—On leaves of *Betula alba;* 7, 19.

M. circææ (Schum.) Winter.—As Uredo on *Circæa Lutetiana;* 4, 17.

Coleosporium tussilaginis (Pers.) Lév.—On *Tussilago Farfara;* 5.

C. campanulæ (Pers.) Winter.—On *Campanula rotundifolia;* 15.

C. euphrasiæ (Schum.) Winter.—On *Bartsia Odontites;* 2.

Milesia polypodii, B. White.—On *Polypodium vulgare;* 19.

Cæoma mercurialis (Pers.) Winter.—On *Mercurialis perennis;* 1, 9.

Ascomyces potentillæ (Farlow) Phil.—On *Potentilla Tormentilla;*

A. Tosquinetii, West.—On leaves of *Alnus glutinosa;* 4.

Lophodermium juniperinum (Fr.) De Not.—On dead leaves of *Juniperus communis;* 18.

Trochila craterium, Fr.—On dead leaves of *Hedera Helix;* 10, 15, 19.

T. lauro-cerasi (Desm.) Fr.—On dead leaves of *Prunus Laurocerasus;* 1, 16.

Stegia ilicis, Fr.—On dead leaves of *Ilex Aquifolium;* 6, 16, 17.

Pseudopeziza calthæ (Phil.) Mass.—On *Caltha palustris;* 17.

Ps. repanda (Fr.) Karst.—On *Galium saxatile;* 11.

Ps. alismatis (Phil. & Trail) Sacc.—On *Alisma Plantago-aquatica;* 17.

Colpoma quercinum, Wallr.—On dead bark of *Quercus Robur;* 5.

Dichæna quercina (Pers.) Fr.—Undeveloped state on living bark of *Quercus Robur;* 6.

Rhytisma acerinum (Pers.) Fr.—On fallen leaves of *Acer Pseudoplatanus;* 7, 9, 11, 18.

Ephelina prunellæ, Phil.—On living *Prunella vulgaris;* 19.

Stictis stellata, Wallr.—On dead stems of *Eupatorium cannabinum;* 19.

Pseudophacidium callunæ, Karst.—On dead branches of *Calluna vulgaris;* 18.

Heterosphæria patella (Tode) Grev.—On dead stem of *Angelica sylvestris;* 9, 19. On *Heracleum Sphondylium;* 11.

Bulgaria polymorpha (Œder) Wett.—On a fallen trunk; 6.

Orbilia marina (Phil.) Boyd.—On dead fronds of *Ascophyllum nodosum;* 19

Calloria fusarioides (Berk.) Fr.—On dead stems of *Urtica dioica;* 7.

Coryne sarcoides (Jacq.) Tul.—On a fallen trunk; 6.

Ascobolus furfuraceus, Pers.—On cow-dung; 6.

Mollisia mercurialis (Fckl.) Sacc.—On dead stems of *Mercurialis perennis;* 7, 11, 19.

M. petiolaris (A. & S.) Sacc.—On dead petioles of *Acer Pseudoplatanus;* 11.

M. rubi (Fr) Karst.—On dead stems of *Rubus Idæus;* 19.

M. digitalina, Phil.—On dead stem of *Digitalis purpurea;* 19.

Belonidium pruinosum (Jerd.) Mass.—On dead Pyrenomycetes; 2.

Helotium marchantiæ (Berk.) Fr., var. conocephali, Boyd.—On thallus of *Conocephalus conicus;* 19.

Sclerotinia baccarum, Rehm.—Ascophores on abortive berries of *Vaccinium Myrtillus;* 11.

Chlorosplenium æruginosum (Œder) De Not.—Mycelium in rotten wood; 9.

Tapesia fusca (Pers.) Fckl.—On dead branches of *Calluna vulgaris;* 19.

Lachnea scutellata (L.) Gill.—On a rotten stump; 6.

Humaria granulata (Bull.) Sacc.—On cow-dung; 6, 10, 13.

Otidea leporina (Batsch) Fckl.—On the ground; 2.

Helvella macropus (Pers.) Karst.—On the ground; 5.

Leotia lubrica, Pers.—On the ground; 2.

Mitrula phalloides (Bull.) Chev.—In boggy ground; 14.

Vibrissea truncorum (A. & S.) Fr.—On dead branches of *Calluna vulgaris* in a watery place; 15.

V. Guernisaci, Crouan.—On dead branches of *Salix aurita* submerged in a stream; 15.

Podosphæra oxyacanthæ (DC.) De Bary.—On *Crataegus Oxyacantha;* 1, 2, 5.

Erysiphe Martii, Lév.—On *Trifolium medium;* 2.

E. cichoracearum, DC.—On *Symphytum tuberosum;* 5, 16.

Asterina veronicæ (Lib.) Cke.—On *Veronica officinalis;* 7, 9, 19.

Cordyceps militaris (L.) Link.—On dead lepidopterous pupæ; 6.

Hypocrea rufa (Pers.) Fr.—On dead wood; 6.

Nectria cinnabarina (Tode) Fr.—On dead bark; 5.

N. coccinea (Pers.) Fr.—On dead bark of *Fagus sylvatica;* 9.

Rhopographus filicinus (Fr.) Fckl.—On dead stems of *Pteris Aquilina;* 19.

Phyllachora graminis (Pers.) Fckl.—On leaves of *Dactylis glomerata;* 19.

Ph. junci (Fr.) Fckl.—On dead culms of *Juncus communis;* 11, 19.

Ph. trifolii (Pers.) Fckl.—On *Trifolium repens;* 6.

Ophiobolus acuminatus (Sow.) Duby.—On dead stems of *Cnicus palustris;* 19.

Leptosphæria agnita (Desm.) Ces. & De Not.—On dead stems of *Eupatorium cannabinum;* 19.

L. acuta (Moug.) Karst.—On dead stems of *Urtica dioica;* 1, 9, 11, 16, 19.

Massaria inquinans (Tode) Fr.—On dead bark of *Acer Pseudoplatanus;* 6.

Diaporthe pulla, Ntke.—On dead branches of *Hedera Helix;* 19.

Venturia myrtilli, Cke.—On decaying leaves of *Vaccinium Myrtillus;* 11.

Gnomonia petiolicola, Fckl.—On dead petioles of *Acer Pseudoplatanus;* 7, 11.

Stigmatea Robertiani, Fr.—On *Geranium Robertianum;* 16.

Sphærella vaccinii, Cke.—On dead leaves of *Vaccinium Myrtillus;* 11.

S. rumicis (Desm.) Cke.—On *Rumex obtusifolius;* 16.

Botryosphæria dothidea (Moug. & Fr.) Ces. & De Not.—On living branches of *Rosa canina;* 7.

Læstadia faginea (Awd.) Cke. & Phil.—On fallen leaves of *Fagus sylvatica;* 7, 9, 11, 19.

Xylaria Hypoxylon (L.) Grev.—On stumps; 4, 5, 6.

Ustulina vulgaris, Tul.—On rotten wood; 2, 4.

Hypoxylon fuscum (Pers.) Fr.—On dead branches of *Corylus Avellana;* 3, 19.

Diatrypella verruciformis (Ehrh.) Ntke.—On dead bark of *Fagus sylvatica;* 2.

Diatrype disciformis (Hoffm.) Fr.—On dead bark of *Fagus sylvatica;* 9.

Phoma pulla, Sacc.—On dead branches of *Hedera Helix;* 19.

Ph. acuta, Fr.—On dead stems of *Urtica dioica;* 9, 19.

Asteroma prunellæ, Purt.—On living leaves of *Prunella vulgaris;* 7, 19.

Actinonema rosæ (Lib.) Fr.—On living leaves of *Rosa;* 5.

Darluca filum (Biv.) Cast.—On *Uredo oblongata;* 7, 16, 18, 19.

Ceuthospora phacidioides, Grev.—On dead leaves of *Ilex Aquifolium;* 5, 16.

Coniothyrium Boydeanum, A. L. Smith.—On dead twigs of *Fuchsia;* 18.

Septoria stellariæ, Rob. & Desm.—On *Stellaria media;* 16.

S. podagrariæ, Lasch.—On *Ægopodium Podagraria;* 16.

S. urticæ, Desm. & Rob.—On *Urtica dioica;* 6.

S. stachydis, Rob. & Desm.—On *Stachys sylvatica;* 2, 9.

Phleospora aceris (Lib.) Sacc.—On leaves of *Acer Pseudo-platanus;* 16, 17.

Leptothyrium alneum (Lév.) Sacc.—On leaves of *Alnus glutinosa;* 15.

Melasmia acerina, Lév.—On leaves of *Acer Pseudo-platanus;* 6, 13, 17.

M. punctata, Sacc. & Roum.—On leaves of *Acer Pseudo-platanus;* 16, 17.

Dinemasporium herbarum, Cke.—On dead stems of *Urtica dioica;* 11.

Glœosporium paradoxum, De Not.—On dead leaves of *Hedera Helix;* 15, 19.

G. fagi, Desm & Rob.—On fallen leaves of *Fagus sylvatica;* 7.

Melanconium bicolor, Nees.—On dead bark of *Betula alba;* 7, 10, 19.

Coryneum disciforme, Kze. & Schm.—On dead bark of *Betula alba;* 19.

Steganosporium piriforme (Hoffm.) Corda.—On dead bark of *Acer Pseudo-platanus;* 5, 6, 13, 17.

Oidium erysiphoides, Fr.—On *Potentilla Tormentilla;* 15.

O. leucoconium, Desm.—On leaves of *Rosa;* 4, 16.

Trichoderma lignorum, Tode.—On dead bark and wood; 5, 17.

Ovularia veronicæ (Fckl.) Sacc.—On *Veronica officinalis;* 16.

O. bistortæ (Fckl.) Sacc.—On *Polygonum Bistorta;* 13, 16.

O. obliqua (Cke.) Oud.—On *Rumex obtusifolius;* 16.

Trichothecium roseum (Pers.) Link.—On dead bark; 5, 9.

Didymaria Ungeri, Corda.—On *Ranunculus repens;* 16.

Ramularia epilobii (Schn.).—On *Epilobium;* 16.

R. variabilis, Fckl.—On *Digitalis purpurea;* 5, 15.

R. calcea, Cés.—On *Nepeta Glechoma;* 16.

R. ajugæ, Sacc.—On *Ajuga reptans;* 16.

Hormiscium pithyophilum (Wallr.) Sacc.—On bark of *Taxus baccata;* 16.

Fusicladium pirinum, Fckl. — On living leaves of *Pyrus communis;* 10.

Polythrincium trifolii, Kze. & Schm.—On *Trifolium repens;* 6.

Cercospora mercurialis, Fckl.—On *Mercurialis perennis;* 4.

Coniothecium amentaceorum, Corda.—On dead bark of *Salix;* 15.

Fumago vagans, Pers.—On leaves of evergreens; 17.

Stilbum tomentosum, Schr.—On *Trichia;* 4.

Tubercularia vulgaris, Tode.—On dead bark; 5, 6, 9.

Cylindrocolla urticæ (Pers.) Bon.—On dead stems of *Urtica dioica;* 7, 11, 18.

Proceedings of the Society.

SESSION 1906-1907.

25th September, 1906.

Mr. J. Ballantyne, Vice-President, in the chair.

The following were elected Ordinary Members, viz.:—Mr. T. Thornton MacKeith, 19 Howard Street; Mr. Henry John Rhodes, Ferguslea, Laird Street, Coatbridge; Mr. J. R. Robertson, Struan, Brownside Road, Cambuslang; and Mr. W. H. M. Smith, 151 West Princes Street.

A report on an excursion to Glen Douglas and Whistlefield was read by Mr. John R. Lee (p. 100).

Mr. Lee exhibited a specimen of *Sphagnum imbricatum*, Hornsch., from Lewis, and made some remarks descriptive of the morphological features of the group of Mosses to which it belongs.

Mr. Alexander Ross showed several examples of *Eristalis æneus*, Scopoli, a dipteron apparently unrecorded for the West of Scotland. These, he stated, had been taken on flowers of Ragwort (*Senecio Jacobæa*) near the sea-shore on the Island of Islay.

Dr. Robert Brown exhibited a specimen of Fool's Parsley (*Æthusa Cynapium*, L.), and drew attention to the poisonous

properties of the plant, and the danger of its being gathered and used in place of Garden Parsley (*Petroselinum sativum*, Hoffm.), to which it bears considerable resemblance.

Mr. Alexander Patience read a paper on "Some Crustacea new to the Clyde Sea and Faunal Areas," which he illustrated by means of numerous specimens.

30TH OCTOBER, 1906.

Mr. D. A. Boyd, President, in the chair.

As this was the Society's Fifty-fifth Annual Business Meeting, the usual Reports were submitted.

Membership, Meetings, &c.—The Hon. Secretary (Mr. Alexander Ross) read the Report of the Council, which stated that since last Annual Meeting the names of ten Ordinary and four Associate Members had been added to the Roll of the Society, while eight Ordinary and three Associate Members had resigned or had their names struck off the list. Two Corresponding and three Ordinary Members had been removed by death, these being respectively the Rev. P. J. Gloag, D.D., Mr. W. Anderson Smith, Mr. Hugh Brown, Sir Charles Tennant, Bart., and Mr. R. Wilson Thom. The Membership is now as follows:—

Honorary Members, - - - - -	16
Corresponding Members, - - -	35
Ordinary Members, - - - - -	222
Associates, - - - - -	13
	286

During the Session ten Meetings were held, at which the highest attendance was 57 and the lowest 25. Eighteen Excursions took place, one of which was arranged jointly with the Geological Society of Glasgow, six with the West Kilbride Natural History and Archæological Society, three with the Andersonian Naturalists' Society, and two with the Paisley Naturalists' Society. Owing to the inability of Mr. P. Ewing, F.L.S., to attend the meeting of the British Association at York, the Society was represented by Mr. James Murray, of the Scottish Lochs Survey.

Finance.—The Hon. Treasurer (Mr. John Renwick) submitted an audited Statement of Accounts (see page 286), which showed a balance of £150 5s. 4½d. at the credit of the Ordinary Fund, and £157 10s. at the credit of the Life Members' Fund.

Library.—The Hon. Librarian (Mr. James Mitchell) submitted a Report, which stated that the interest of the members in the Library continued to be well sustained, as was shown by statistics submitted of the number of volumes borrowed during the year. The books were all in a satisfactory state.

Transactions.—The Hon. Editor (Mr. John Paterson) reported on the progress of publication of the material in his hands.

The Reports were all approved and adopted.

Vacancies among the Office-bearers were filled up by the election of Mr. Robert Garry, B.Sc., as a Vice-President, and Messrs. John R. Thomson, W. R. Baxter, Keith Buchanan, and Nicholas G. Reid, as Members of Council.

Messrs. James Jack and Joseph Sommerville were re-appointed as Auditors.

Mr. James R. Menzies, 6 Woodcroft Terrace, Jordanhill, was elected an Ordinary Member.

Reports were submitted of Excursions to Milngavie and Strathblane (p. 100), Perceton, and from Dalry to Fairlie (p. 238).

Mr. T. B. Henderson, M.D., exhibited a fine specimen of the Indian Spring-tailed Lizard, *Uromastix Hardwickii* (Gray), one of the Agamidæ, and made some remarks descriptive of the characteristics and affinities of the species.

Mr. David Ligat showed specimens of Black Bryony (*Tamus communis*, L.), Red Bryony (*Bryonia dioica*, L.), and various other plants from Surrey.

Mr. James Whitton, Superintendent of Parks, submitted his "Meteorological Notes for 1905, and Remarks upon the Weather during the year, with its General Effects upon Vegetation" (p. 30).

27TH NOVEMBER, 1906.

Mr. D. A. Boyd, President, in the chair.

A Report on the Fungus Forays to Hawkhead and Torrance, compiled by Messrs. R. B. Johnstone and D. A. Boyd, was submitted (p. 239).

Mr. T. B. Henderson, M.D., exhibited specimens of various Reptilia. These included *Eryx Johnii* (Russell), an Indian Sand-snake, of nocturnal and burrowing habits; a young *Boa constrictor*, L., which had been landed amongst bananas and was found alive in Glasgow, and kept in a living state for some time; *Chameleon parvilobus*, Boulenger, a native of South Africa; and *Chameleon pumilus*, Daudin, a native of Cape Colony. The various specimens were fully described, and attention directed to their distinctive features.

Mr. Robert W. S. Wilson exhibited a fine example of the Grey Lag-goose (*Anser cinereus*, Meyer), which was shot at Dickie's Burn, Fairlie, on 13th November. He also showed specimens of the Grey Plover (*Squatarola helvetica*, L.), and Golden Plover (*Charadrius pluvialis*, L.), also shot at Fairlie, and of the Rough-legged Buzzard (*Buteo lagopus*, Gmelin), from Langbank.

Mr. J. Ballantyne submitted a List of Plants found on the Island of Bute (p. 219).

Mr. John Cairns, Jun., read a paper entitled "Notes on the Maples," which he illustrated by means of a series of specimens of the leaves of the various species and varieties.

26TH DECEMBER, 1906.

Mr. John Cairns, Jun., Vice-President, in the chair.

Miss K. Graham Allan, 1 Grosvenor Terrace, was elected an Ordinary Member.

The meeting was devoted to the exhibition of lantern slides illustrative of various branches of natural history, topography, &c. Ornithological subjects were dealt with by Messrs. W. R. Baxter, Charles Kirk, T. Thornton MacKeith, James W. Reoch, John Robertson, and Hugh W. Wilson, each of whom showed a fine series of slides representing many species of native Birds, with their nests, eggs, and young, and depicting some of the most attractive phases of bird-life. Botany was illustrated by Messrs. George Herriot, Robert M'Lean, J. Fleming, W. Goodwin, and David R. Somerville, whose slides included views of wild plants in their native habitats, as well as numerous artistic floral studies, &c. A series submitted by Mr. Robert Garry, B.Sc., contained some fine micro-photographs of Fresh-water Algæ. Scottish geology, as illustrated by highland mountains and glens,

formed the subject of a beautiful set of slides shown by Mr. Reoch; while various other interesting topographical views were submitted by Messrs. Herriot, M'Lean, Somerville, and Wilson.

29TH JANUARY, 1907.

Mr. J. Ballantyne, Vice-President, in the chair.

Dr. T. Beath Henderson exhibited a specimen of *Gecko verticillatus*, Laurens, and described the striking peculiarities in the structure of the toes, which are characteristic of the Geckinidæ. The majority of the species have these organs dilated into various club forms, in the lower surface of which are symmetrical plates. These serve as a means of adhesive progression. He also submitted for exhibition a specimen of *Aristelliger præsignis*, Hallow, from Jamaica, sent to him by Mr. Thomas Wishart.

Mr. John Robertson exhibited a number of eggs of the Tree-Sparrow (*Passer montanus*, L.) from Bute. He stated that the species had formerly been considered a rare bird in the West of Scotland, but he had discovered a small colony of them recently on the south coast of Bute, and he had no doubt that they would be found plentifully in other places.

Mr. Robert Henderson showed some specimens of Diptera from Bute, amongst which were *Tabanus sudeticus*, Zeller, *T. autumnalis*, L., *Cyrtoma spuria*, Fln., *Medeterus apicalis*, Ztt., *Chilosia grossa*, Fln., *Melanophora roralis*, L., *Hydrotæa albipuncta*, Ztt., *Drymia hamata*, Fln., and *Fucellia fucorum*, Fln.

Mr. Alexander Ross, for Mr. John E. Murphy, exhibited *Piezodorus lituratus*, Fab., from Bute, which, he stated, had been captured by Mr. Murphy at Port-Bannatyne on 28th September last. The species is not included in the List of Hemiptera contained in the British Association Handbook, and thus becomes an addition to local records. It is generally distributed in England and Ireland, and is chiefly found feeding upon broom and furze. Several other entomological specimens were also submitted by Mr. Ross.

Mr. Peter Ewing, F.L.S., read a paper on "Some New or Little-known Forms of the Genus *Carex*," and exhibited a series of illustrative specimens.

26th February, 1907.

The meeting was held in the Laboratory of the Natural History Department, Glasgow University. Mr. D. A. Boyd, President, occupied the chair.

In the course of some preliminary remarks, the chairman referred to the many associations which in past years had existed between the Professors and Lecturers in the University and the Natural History Society of Glasgow.

Professor J. Graham Kerr, F.R.S., F.L.S., F.Z.S., made some remarks expressive of his views regarding the sphere of work of Marine Biological Stations, with special reference to the Millport Marine Station, in the management of which some differences of opinion as to policy have recently arisen. When the magnificent natural facilities existing in the Clyde estuary for the work of such an institution are taken into account, a splendid future may be regarded as certainly in store for the Millport Laboratory, if all concerned with its management can agree to sink minor differences of opinion as to detail, and so work together as to enable the professed aims of the Association—the " Investigation of the Marine Fauna and Flora "—to be fully realised. Much misconception, however, appears to have arisen with regard to the meaning of these words. Reference may therefore be made to the series of magnificent monographs issued by the Naples Marine Station, as affording an indication of what a biologist means when he uses such an expression. It is only possible to specify, in its most general lines, the kind of work involved in such investigations. It would mean that every day throughout the year, when circumstances permit, the steamer should be employed in this work; and that active collecting would be carried on, and exact observations made as to time, position, direction of currents, temperature of water, and various other conditions of environment existing at the moment. These observations would be carefully recorded at the time in a detailed log, the entries in which would form the justification for each day's work with its corresponding expenditure. The staff of the station would be kept fully occupied by their work of collecting, observing, and recording, as well as by their administrative duties ashore. In regard to

the identification of species, the help of active workers who are specialists in particular groups would be looked for and doubtless accorded.

The encouragement and co-ordination of the work of local amateur biologists should also be one of the main functions of an Association such as that at Millport. It is well known that in Glasgow there are enthusiastic workers who are doing admirable work, and making important contributions to our knowledge of the local fauna. Such workers should be able to rely upon receiving every help and encouragement from the Association, and the latter, in turn, should be able to count on their assistance and loyal co-operation.

While experience has shown how extremely difficult it is to run an aquarium on merely popular lines without ending in financial disaster, such an aquarium might be admirably managed as an adjunct to a scientific laboratory. This may be instanced by reference to the Naples Marine Station, with its magnificent show-tanks which form one of the greatest attractions to visitors to that city. These popular tanks are, of course, isolated from the portion of the institution reserved for scientific work, so as to insure that the actual workers will be free from interference or interruption.

As regards the educational side of such an institution, one of the first evidences of a Marine Laboratory being a thorough success will be found in the attraction to it from elsewhere of persons distinguished in scientific research. This was frequently the case at Millport in earlier days, when distinguished investigators came to the Firth of Clyde from England and other countries. Looking to the future, it would doubtless be in many cases possible to induce such biologists while at Millport to give short courses of instruction in the special departments of biological science on which they are authorities. If all interested in the Association are able to work together, and help it to make its chief line of activity—that of "investigation"—a thorough success, they may then, as a natural consequence, count with every confidence on the development of its popular and educational functions as well.

Professor Kerr then delivered a lecture on the subject of "A Naturalist in South America," in which he gave an

account of the main geological features of certain regions of that country. The first to be described was the region of the Pampa, or grassy treeless plain, which stretches from Rio de la Plata to the Andes. It possesses a characteristic surviving fauna and traces of a wonderfully rich extinct one. A description was next given of the region of the Gran Chaco, a great wilderness, which, lying to the west of the River Paraguay, forms the northward continuation of the Pampa. The four great types of scenery characteristic of this region —the river, the forest, the savannah, and the swamp—were described, and their special biological features defined. The rivers of the Chaco are mostly narrow, tortuous, and somewhat sluggish streams. In the neighbourhood of the large rivers, the forests are luxuriant, and resemble those of Paraguay and Brazil; but in the interior of the Chaco they are scrubby, and are cut up into islands scattered about in the savannah. The savannahs are grassy plains dotted over with fan-palms. The swamps are characterised by their dense vegetation, with pools and lagunas of open water here and there. During the lecture many beautiful lantern slides illustrative of South American scenery were exhibited on the screen, and at the end a few were added to show some of the types of the red-skinned inhabitants of the Chaco.

Dr. T. Beath Henderson moved a vote of thanks to the lecturer and his assistant, which was heartily accorded by a large and appreciative audience. A very extensive collection of specimens, part of which were preserved in bottles and part mounted for microscopical examination, was arranged for exhibition in the large hall, and examined with much interest.

26th March, 1907.

Mr. D. A. Boyd, President, in the chair.

The chairman referred to a movement for the institution of a Representative Council of Natural History Societies in Glasgow and throughout the district included within the Clyde Area. He indicated some of the obvious advantages which would be derived from such an association, and recommended that the Society should express its approval of the project by

electing a delegate to act as its representative on the proposed Council, and give all possible aid in bringing the movement to a successful issue. This was unanimously agreed to, and Mr. Alexander Ross was appointed to represent the Society on the proposed Council.

Mr. Robert Dunlop exhibited several zoological specimens which he had obtained while in New Zealand. These included examples of *Dactylocnemis granulatus*, the Long-tailed Lizard of New Zealand, and of *Morrisonia chrysorytha*, Hampson, and *M. chlorograpta*, Hampson, two species of Moth new to science.

Mr. Alexander Patience submitted specimens of *Halimus hectori*, Miers, and *Petrolisthes spinosus*, Miers, two species of Crab obtained in New Zealand by Mr. Dunlop, and he gave an account of their morphological features.

Mr. John Smith, corresponding member, sent for exhibition a specimen of the Heart-leaved Twayblade (*Listera cordata*, Br.), gathered by him on the Shalloch-on-Minnoch Moor, in the Parish of Barr, Ayrshire.

The chairman showed fine specimens of *Habrodon Notarisii*, Schp., a rare Moss, from the Island of Bute, and stated that it had not hitherto been recorded for Vice-County 100.

Mr. A. Somerville, B.Sc., F.L.S., communicated a paper on the "Occurrence of the Rock Samphire (*Crithmum maritimum*, Linn.), and the Marsh Helleborine Orchis (*Epipactis palustris*, Crantz), on the West of Scotland" (page 115).

30th April, 1907.

Mr. D. A. Boyd, President, in the chair.

Reports were submitted on excursions to South Bute (page 239), and Lochwinnoch (page 241).

Mr. Boyd exhibited specimens of *Cinclidotus fontinaloides*, P. Beauv., from Castlesemple Loch, Renfrewshire, along with a number of other Mosses freshly gathered.

Mr. Edward J. Bles, B.A., D.Sc., F.R.S.E., read a paper on "Plankton," which he illustrated with many varied and interesting lantern slides. He defined the real meaning of the term, described the methods adopted for obtaining accurate

knowledge of the fauna and flora of the sea, and, by means of the lantern, showed the apparatus used in this department of research.

Mr. Alexander Ross, Delegate to the Clyde Naturalists' Representative Council, read a report on the proceedings at the preliminary meeting of Delegates from Naturalists' Societies in the West of Scotland, held on 6th instant, at which a resolution to form the Representative Council had been unanimously agreed to, and a formal constitution adopted. On the suggestion of Mr. Boyd, the Society expressed its approval of the method indicated in the constitution for defraying the expense of the Council's operations, which was proposed to be met by levying on each Society represented in the Council a share of the expense proportionate to the number of such Society's members and the amount of revenue derived from their annual subscriptions.

28TH MAY, 1907.

Mr. D. A. Boyd, President, in the chair.

Reports were given on Excursions to Cartland Crags (page 241) and Loch Riddon (page 242).

Mr. Alexander Ross exhibited, by favour of Mr. W. Bevins, Ongar, a small collection of South African Coleoptera, mainly captured on Table Mountain and in its vicinity. The specimens were small, but beautifully marked. The insects usually shown from South Africa are large and conspicuous, but Mr. Bevins, in his work among the insects of smaller size, was fortunate in discovering many which were new to science.

Mr. Ross also showed a specimen of *Bombylius major*, L., taken at the head of Loch Riddon. He stated that this dipteron belongs to the "Bee-Flies," and possesses a long oral proboscis with which it sucks honey from flowers. It is a rather rare fly in the Clydesdale district, where it has only previously been recorded from this same station. He also exhibited a living specimen of the Blindworm (*Anguis fragilis*, L.) captured at the same place, and he described the superficial and anatomical features whereby this harmless reptile is distinguished from the Common Adder (*Pelius berus*, L.) for which it is often mistaken.

Mr. Robert Godfrey submitted for exhibition a specimen of *Chelifer cancroides* (L.), one of the group of mites known as "False Scorpions." The species occurs commonly in a stable in the eastern district of Glasgow, but is apparently new to the Scottish list. He showed a specimen of the Sea Centipede (*Linotœnia maritima*, Leach), from Rough Island, in the Solway, and stated that he had also observed that species in 1904, at Shirvan, Loch Fyne. He submitted a specimen of the Pencil-tailed Myriapod (*Polyœnus lagurus*, L.), from Rough Island, and stated that the same species had likewise come under his notice on a hill-top at Ronachan, Kintyre, in the end of the year 1905 or beginning of 1906.

Mr. Peter Ewing, F.L.S., read a short statement regarding the business discussed at the Meetings of Delegates from Corresponding Societies of the British Association, held last year, during the visit of the Association to York.

Mr. D. A. Boyd read a paper entitled "Microfungi observed in Islay" (page 119).

Mr. James Whitton, Superintendent of Parks, submitted his "Meteorological Notes for 1906, and Remarks upon the Weather during the Year, with its General Effects upon Vegetation" (page 122).

25th June, 1907.

Mr. D. A. Boyd, President, in the chair.

Before proceeding to the business of the meeting, the chairman referred to the death of the late President, Mr. Alexander Somerville, B.Sc., F.L.S., which took place on 5th instant. It was resolved that the Society should place upon record its sense of the great loss which had thus been sustained, and its grateful acknowledgment of the many important services which Mr. Somerville rendered to the cause of science, particularly in the West of Scotland, and to this Society, in whose work he so long took an active and useful part.* It was also resolved that an excerpt from the minutes, containing the above resolution, should be transmitted to Mrs. Somerville, along with an expression of the sympathy of the members of the Society with her and her family in their bereavement.

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* See page 227.

Reports were submitted on Excursions to Calderwood Glen (page 241), Auchans and Dundonald (page 241), Auchendrane (page 244), and Monkland and Woodhall (page 245).

Dr. Thomas Beath Henderson exhibited specimens of *Silybura brevis*, Gunther, and *S. macrolepis*, Peters, two species of Indian Shield-tailed Snake. After describing the general features of the Uropeltidæ, to which these small-sized reptiles belong, he referred to the characteristics of the genus *Silybura*, and drew attention, in particular, to the remarkable formation of the tail, which is well adapted to the earth-burrowing habits of the species. This was more fully illustrated by means of a drawing carefully prepared by Miss Henderson.

Mr. Alexander Ross exhibited a female specimen of *Didea alneti*, Fallén, taken on Inch Connachan, Loch Lomond, on 15th June, and apparently the first record for the West of Scotland. He stated that the species is but little known in England, there being only three records of individual specimens given by Mr. Verrall in his work on the Syrphidæ of Great Britain, viz., a male in Worcestershire, August, 1894; a female near Birmingham, August, 1895; and a female in Herefordshire, August, 1895. An account was given of the characteristics of the genus *Didea*, which is closely allied to *Syrphus*, and is represented in Europe by three known species, all of which occur in Britain.

Mr. Ross also showed a nest of a species of Weaver-bird, from the neighbourhood of Poonah, upon which he made some remarks.

Mr. John Smith, Corresponding Member, exhibited specimens of *Ranunculus auricomus*, L., from Barwharrie, Ochiltree; and a variety of *Polypodium vulgare*, L., with forking pinnæ, from Giffordland, Dalry.

Mr. John Renwick exhibited *Rumex Hydrolapathum*, Huds., and *Scrophularia alata*, Gilib., from Woodhall; also *Æsculus flava*, Ait. (= *Pavia flava*, Mœnch), from Monkland House.

Mr. Peter Ewing, F.L.S., showed a specimen of *Poa Chaixii*, Vill., from Auchendrane.

Mr. D. A. Boyd showed specimens of *Neckera complanata*

(L.) Hübn., bearing capsules, which he stated had been obtained at the recent excursion to Auchans. Although a common Moss, this species seldom occurs in a fertile condition.

A very interesting series of photographs was submitted, including views of birds, birds' nests, botanical subjects, and picturesque scenery, taken at South Bute, by Mr. W. R. Baxter; views of scenery on the Mouse Water, near Lanark, by Mr. N. G. Reid; and photographs of trees at Auchendrane, by Mr. James Whitton and Mr. John Renwick.

Mr. Alexander Patience read a paper on "Further Additions to the Crustacea of the Clyde Sea and Faunal Area."

ABSTRACT STATEMENT OF ACCOUNTS—SESSION 1905-1906.

1905.—Sept. 1.								
To Balance—Life Members' Fund, Debentures,			£75	0	0			
Do., on loan at 4 per cent.,			82	10	0			
			£157	10	0			
Ordinary Fund, on loan,	£4	10	0					
Do., in Bank, and in Treasurer's hand,	131	5	7					
			135	15	7			
						£293	5	7
1906.—Aug. 31.								
To 163 Members' Annual Subscriptions, @ 7s. 6d.,						61	2	6
,, 22 Members' Arrears,						8	12	6
,, 11 Associates' Subscriptions, @ 5s.,						2	15	0
,, Interest,						9	0	7
,, *Transactions* sold,						0	11	7
,, *Transactions* to Mitchell Library,						4	12	8
,, Donations to Illustration Fund,						0	9	6
						£380	9	11

From Balance of £150 5s. 4½d. falls to be deducted cost of *Transactions* for three Sessions.

1906.—Aug. 31.								
By Rent and Attendance,						£12	7	6
,, Postage, Stationery, &c.,						14	8	11
,, Printing Circulars,						4	18	9
,, Printing *Transactions*,						25	8	6
,, Carriage on *Transactions*,						1	7	8
,, Library—New Books,			£8	6	6			
Insurance,			0	12	0			
Binding,			1	16	6			
Postages, &c.,			1	19	2½			
						12	14	2½
,, Lantern Expenses,						0	8	0
,, Donation to Marine Biological Association,						1	1	0
,, Balance—Life Members' Fund, Debentures of the Modern Permanent Building and Investment Society, Melbourne,			£65	0	0			
Do., on loan @ 4 per cent,			*87	0	0			
In Bank,			5	10	0			
			£157	10	0			
,, Balance, Ordinary Fund, in Bank, and in Treasurer's hand,			150	5	4½			
						307	15	4½
						£380	9	11

* On Security of Guaranteed Railway Stock.

GLASGOW, 22*nd October*, 1906.—We have examined the Accounts, and compared same with the relative Vouchers and Securities, and find them correct. Cash in Treasurer's hands, Two pounds and one halfpenny.

(Signed) JAMES JACK,
JOSEPH SOMMERVILLE, } *Auditors.*

SESSION 1907-1908.

24th September, 1907.

Mr. D. A. Boyd, President, in the chair.

The chairman referred to the death of the Rev. John Fergusson, LL.D., Fearn, Brechin, one of the Corresponding Members of the Society, who was distinguished for his researches in Scottish Botany, especially in the departments of Bryology and Mycology.

Reports were submitted on Excursions to Dalry (page 246), Finlayston (page 247), and Glen Douglas (page 251).

Mr. Peter Ewing, F.L.S., exhibited a specimen of *Carex filiformis*, L., from Loch Lydoch.

Mr. D. A. Boyd submitted specimens of *Amblystegium fluviatile*, B. and S., a Moss obtained at the excursion to Finlayston on 10th ultimo, and not previously recorded for Vice-County 76; *Hypnum crista-castrensis*, L., from the woods at Inveraray Castle; and *Otidea leporina* (Batsch) Fckl., from Montgreenan, Ayrshire. He stated that the last-mentioned species had been discovered by Mr. R. B. Johnstone at the Fungus-Foray on 21st instant, and had not been previously recorded for the Clyde Area.

Dr. Robert Brown read a paper descriptive of the district of La Lautaret, in Dauphiny, S.-E. France, with special reference to its plant life. He stated that he had spent a holiday in that district last year, and had again returned this year to renew his acquaintance with the place and its flowers.

La Lautaret stands 6,790 feet above sea level. The only house in the district is an old Hospice, with a number of wooden annexes which form the hotel accommodation; and the district itself is composed of wide-spreading prairies, gradually rising upwards to the various mountain ridges which stand like sentinels all around. The Hospice occupies the summit of the pass, which runs from Bourg d'Oisans to Briançon near the Italian Frontiers, and is traversed by a very good road. The peaks above Lautaret rise to 10,000 and 11,000 feet, some being composed of slaty rocks, many of limestone, and others of granite. All the district is clad with a marvellous wealth of vegetable life. One may spend days

within an hour's walk of the Hospice, and gather armfuls of gay flowers worthy of any garden in the land; while up the higher slopes, among the stones and loose rocks, rare and interesting creeping alpines abound. In the ascent of the streams from the valleys to the highest ridges may be found an unlimited wealth of comparatively rare species.

By the side of the Hospice a very well-kept Rock and Alpine Garden has been made. It was first begun about the year 1898, by the University of Grenoble, and has been kept up by jardinier botanists from the Botanic Gardens of Lyons. Here one may see growing, and carefully named, many of the rare and ornamental native plants, as well as many brought from other districts of France. The garden is an endless source of interest to the travellers who stay in passing for a break in their journey. In connection with this garden, a room is set apart in one of the annexes for a botanical laboratory, where work goes on all the season, and botanists who may visit the district are courteously invited to use the room, with its materials. Many noted botanists visit Le Lautaret, and a book is kept with their autographs and written testimonies to the interesting nature of the district as a field for botanical work.

A very striking feature of the flora of the prairie or undulating meadow-land in Lautaret is the vigorous growth of the vegetation. Although at a minimum altitude of 7,000 feet, the great mass of the plants are tall and strong, many from two to three feet in height—an exceptional condition in so lofty a situation. With this, however, there is an equally extraordinary growth of root. Even with the lower-growing alpines, roots are found measuring two and three feet in length, these long root-fibres straggling among and under the looser rough surface and stony ground. Another feature of the strong development in plant life is the tendency to the formation of woody stems, especially near the roots. Many of the mountain plants in Lautaret are strikingly marked by the hard, almost stony condition of their stems, elsewhere soft and easily crushed. Another peculiarity in the plant life of this district is the presence in the open prairie of species generally found in woods or gorges.

But although the plant life of Lautaret is thus vigorous and exceptionally robust, it is no less remarkably varied, and possesses many of the rarer species which occur on the mountains running along the Italian frontiers. It is interesting to find some of our own native plants intermixed with some of the rarer forms of Southern Europe, both equally at home in these highlands.

Around the Hospice, and forming, no doubt, the basis of the rich soil on which this luxuriant wild garden exists, are jagged peaks rising up to 9,000 feet, composed almost entirely of dark slaty rock. This substance lies on edge, and a constant process of surface crumbling is going on. Near the rocks the material broken down is in larger pieces, but lower down the slopes it gradually assumes finer division, until at last it forms the rich basis of a soil deep, porous, and cool, in which the plant world seems to luxuriate. To this fact is attributable the extraordinary growth of this high-placed flora. Farther afield, especially southwards, are ranges of limestone rocks, which also give splendid results in their meadows below, and have a distinctive bias in the variety of their rock plants; while at other points granite rocks predominate, and there the flora gradually shrinks into comparative smallness, both as to varieties and size. This variation in soil material gives to the observer a very good demonstration of the important influence exercised by physical conditions in the life-history of plants growing within large and small areas. A striking feature of the district is the entire absence of trees, the only representative being a shrubby Alder which on some slopes forms dense masses that can scarcely be penetrated. A very interesting method of botanizing the district is to take in rotation the different levels and work them apart. Thus, the lower prairie land, with its comparatively level and often swampy surface, yields a flora completely different from that of the higher mountain slopes, while the rocky peaks, in their varied construction, each afford interesting species for examination.

In the course of the paper, Dr. Brown referred to many of the rarer and more interesting alpine plants which he had observed in the district around Lautaret, and submitted for

exhibition a fine series of illustrative specimens. He stated that while many of the rarer species had only been obtained after some hard climbing and strenuous exertion under trying circumstances, the great majority were found and secured with much more ease than he had ever before experienced in any other alpine centre. In that respect, and on account of the marvellous floral display which could so easily be seen and enjoyed on its widespread prairies in July and August, the district might be truly described as altogether unique for such an elevation.

Mr. Robert Dunlop presented to the Society's Library a copy of " New Zealand Neuroptera," by G. V. Hudson, F.E.S.

27TH OCTOBER, 1907.

Mr. John Cairns, jun., Vice-President, in the chair.

As this was the Society's Fifty-sixth Annual Business Meeting, the usual Reports were submitted.

Meetings, Excursions, &c.—The Hon. Secretary (Mr. Alexander Ross) read the Report of the Council, which stated that during the past session ten Meetings of the Society had been held, at which the attendance was up to the average of several years past. While most of the papers read related to botanical subjects, the specimens exhibited at the meetings were varied and interesting.

Seventeen Excursions were projected, and a list of these was issued to the members in the form of a booklet containing a synopsis of the various interesting features to be met with in places proposed to be visited. This new form of excursion programme was greatly appreciated by the members. With the exception of two, the Excursions were all carried out. Four were held jointly with the Andersonian Naturalists' Society, three with the West Kilbride Natural History and Archæological Society, one with the Hamilton and District Field Club, one with the Airdrie Natural History Society, and two with the Geological Society of Glasgow. The attendance varied, but was mainly good, this being specially the case with the Fungus Forays held jointly with the Andersonian Naturalists' Society.

British Association.—At the Leicester meeting the Society was represented by Mr. Peter Ewing, F.L.S.

Membership.—During the session, 6 new Members were added to the roll of the Society, 8 Ordinary Members and 3 Associates resigned, 7 were struck off for non-payment of subscription for several sessions, and 7 were removed by death. Among the last were Mr. Alexander Somerville, B.Sc., F.L.S., Life Member, and Rev. John Fergusson, LL.D., Fearn, Corresponding Member, of whom obituary notices were brought before the Society.

The membership now stands as follows :—

Honorary Members, - - - -	16
Corresponding Members, - - -	34
Ordinary Members, - - - -	206
Associates, - - - - -	10
Total, - - - - -	266

Finance.—The Hon. Treasurer (Mr. John Renwick) submitted an audited Statement of Accounts (see page 306), which showed a balance of £124 5s. 5d. at the credit of the Ordinary Fund, and £157 10s. at the credit of the Life Members' Fund.

Library.—The Hon. Librarian (Mr. James Mitchell) reported as follows :—" During the past year the interest of the Members in their Library has been fully sustained. The returns for the year show a slight falling off in the numbers of volumes issued to members. These are 190, as compared with 200 in preceding year. This is about an average issue, taken over the past few years. During the month of February, Part 3 of Vol. VII. of our *Proceedings* was issued to the members, and this part has also been sent to the various institutions and British Societies with whom we exchange publications. The usual number of exchanges have been received during the year. These now include nearly all the Scottish Societies of importance who issue Transactions. Five volumes have been gifted to the Library by members and friends, to whom we owe our thanks. Fourteen volumes have been added by purchase during the session. The Foreign and Colonial Transactions received during the year have been placed in the Mitchell Library. Members are reminded that the Trans-

actions housed there can be consulted or borrowed during the open hours of the Library. Books can also be borrowed from our own Library during the open hours of these rooms. The books in the Library are all in good condition. The Transactions and Magazines are all bound up to date."

Transactions.—The Hon. Editor (Mr. John Paterson) reported on the progress of the work of printing the papers and other material relating to Sessions 1905-6 and 1906-7.

The Reports were all approved and adopted.

Vacancies among the office-bearers were filled up by the election of Mr. Robert Henderson as a Vice-President, and Messrs. Thomas Beath Henderson, M.D., Robert W. S. Wilson, John Cairns, jun., and T. Thornton Mackeith, as Members of Council.

Messrs. James Jack and Joseph Sommerville were re-appointed as Auditors.

Mr. Cameron Davidson, Windyhill, Kilmacolm, was elected an Ordinary Member.

A Report on an Excursion to Dunure was submitted by Mr. John Smith, Corresponding Member (page 252).

Mr. Peter Ewing, F.L.S., the Society's representative at the recent meeting of the British Association at Leicester, submitted a report on the business discussed at the two meetings of Delegates from Corresponding Societies, at both of which he was present. Special reference was made to the address delivered at the first meeting by the president, Mr. H. J. Mackinder, on the advancement of geographical science by local societies, and to the subject of correlation of work by such societies. At the second meeting, the principal speaker was Mr. Carleton Rea, Worcester, who urged that fungi should receive much more attention from provincial societies than had hitherto been bestowed. The subject of rainfall records was also introduced by Dr. H. R. Mill, who recommended that the number of observing stations throughout the country should be largely increased. Mr. Ewing offered some practical suggestions indicative of how the Society might take an active and useful part in these and other kindred investigations.

Dr. Thomas Beath Henderson exhibited dried skins of *Bitis gabonica*, D. & B., and *B. nasicornis*, Shaw, two species of

Puff-adder from Rhodesia. These he stated to be viperine snakes, having the head very distinct from the neck and covered with imbricated scales. The nostrils are directed upwards, or upwards and outwards, while the body is thick, and the tail very short. These snakes are remarkable for possessing enlarged horn-like scales between the supra-nasals. *B. gabonica* has a single enlarged scale above the supra-nasal, in contact with its fellow, while *B. nasicornis* has two or three, which are usually separated by small scales.

Mr. Henry M'Culloch showed a specimen of the Glossy Ibis, *Plegadis falcinellus* (L.) shot near Kilmarnock, this being the first record of the occurrence of the bird in that neighbourhood.

Dr. Thomas F. Gilmour sent for exhibition some specimens of Water Betony (*Scrophularia aquatica*, L.) found growing plentifully on the banks of the Cornabus Burn, Islay, and he communicated some notes on the probable causes which had led to its sudden appearance in that locality (see page 219).

26TH NOVEMBER, 1907.

Mr. D. A. Boyd, President, in the chair.

Messrs. W. L. Chadwick, 2 Beechwood Terrace, Albert Road, Langside, and G. C. Cossar, M.A.(Oxon.), East Craigs, Corstorphine, were elected ordinary members.

By favour of Mr. G. Graham, Girvan, Mr. John Robertson exhibited a nest and egg of the Pied Flycatcher (*Muscicapa atricapilla*, L.), from Glendoune, Girvan, with photographs of the bird sitting on the nest. He described the circumstances under which the nest had been found, and stated that this species has only recently been added to the list of birds which breed in the Clyde Area, three instances of nests observed at Glendoune since 1901 by Mr. Graham and others being the only records known.

Mr. Alexander Ross exhibited specimens of *Eristalis sepulchralis*, L., one of the Syrphidæ, captured in the Ard, Port Ellen, Islay, on 1st August last. The insects were flying abundantly about a quantity of decaying sea-weed which had evidently been collected for purposes of kelp-making and left

to rot. They were flying very low, and were extremely difficult to capture. The insect is not uncommon in England, but all Verrall's localities are south of the Midlands, except one, based on a single specimen taken in Warwickshire. Wingate does not record it from Northumberland or Durham. In the West of Scotland it has only been recorded for Possil Marsh, where it was taken by the late Mr. George W. Ord, Mr. Robert Henderson, and Mr. Ross. Reference was made to the characteristic features which distinguish this fly from *E. æneus*, Scop., its nearest ally.

Mr. Ross also showed several botanical specimens, including *Eucalyptus rostrata*, Schlecht., in fruit; *Acacia melanoxylon*, R. Br., with phyllodes and true leaves; and *Camellia theifera*, Griff., var. *assamica*, the Indian Tea-plant, in flower.

On behalf of Mr. John Smith, Corresponding Member, Mr. Ross submitted several zoological and botanical specimens from Ayrshire. These included cocoons of *Meta menardi* (Latr.), a Spider which haunts the dark recesses of caves on the Carrick Coast, where its nests, spun of a fine, white, gossamer fabric, may be found hanging from the roof by an attachment of about a score of threads. Besides frequenting caves, this species sometimes occurs in the vaults under old castles.

Mr. Smith also sent a specimen of Rock-Samphire (*Crithmum maritimum*, L.) from the Carrick Coast, where it grows in certain of the more inaccesible places; a plant of Wild Beet (*Beta maritima*, L.), with fasciated stem, from the same district; and *Ahnfeltia plicata*, Fries, a marine alga also obtained on the Carrick shore. It was stated that the two last-mentioned specimens had respectively been submitted to Messrs. Arthur Bennett, F.L.S., and A Gepp, M.A., F.L.S., for identification.

Mr. William Stewart showed a specimen of *Auricularia mesenterica*, Fr., from Olton, near Birmingham, and described the distinctive features of the genus and species.

Mr. D. A. Boyd read a paper entitled " With the Cryptogamic Society of Scotland at Inveraray " (page 143).

Mr. Peter Macnair, F.R.S.E., F.G.S., gave a short address on " The Present Position of the Local Collections in the Kelvingrove Museum," with special reference to natural

history. By diagram he indicated the intended arrangement of the Natural History Section, and the methods which were to be chiefly adopted in the building up of complete educational and scientific collections in the museum. He referred to the large masses of material lying in the institution which required to be classified and named, and appealed to the members of the Society to come to the aid of the curator and his assistants in arranging and making available this accumulated store. A discussion then took place on various aspects of the subject dealt with in Mr. Macnair's address, particularly with reference to material collected by members of the Society and placed in the museum, and to the best methods of arranging that material so as to enhance its utility for purposes of reference and insure its preservation.

19th December, 1907.

Mr. D. A. Boyd, President, in the chair.

Before proceeding to the business of the meeting, the chairman referred to the great loss which science had sustained in the death of Lord Kelvin—an event which may be truly said to have cast its dark shadow over the whole civilised world. In that early moment of sorrow it was impossible fully to appreciate the extent of such a loss, or adequately to estimate the worth of the life and labours which had so recently come to an end. But everyone must feel sensible that Lord Kelvin's marvellous insight into the secrets of nature, and inexhaustible fertility of discovery and invention, whereby hidden physical forces have been brought directly into the service of humanity, must earn for him the undying gratitude of mankind. For more than half a century his brilliant intellectual personality shone in and around the University of Glasgow, shedding its lustre far afield, and casting a clear light into many regions of research previously dark and obscure. But in addition to marvellous scientific endowments, he possessed a versatility of mind and a wide sympathy for humanity which rendered him an active and useful citizen, ever ready to take part in any movement for the benefit of mankind, for the alleviation of distress, or for the relief of suffering. For almost twenty years

Lord Kelvin was a member of this Society, and continued to take an interest in its welfare and work.

On the motion of the chairman, it was resolved that the Society should place upon record its deep regret at the announcement of the death of Lord Kelvin, and express its appreciation of his great services in the advancement of physical science, and the many and lasting benefits which his brilliant discoveries have conferred upon mankind. The Secretary was instructed to forward to Lady Kelvin an excerpt from the minutes containing the above-mentioned resolution, with an expression of the Society's sympathy with her and the other relatives of the deceased peer in the bereavement which they have sustained.

Mr. James J. F. X. King, F.E.S., 1 Athole Gardens Terrace, Kelvinside, was elected an Ordinary Member.

Mr. D. M. Wood, 9 Main Street, Bridgeton, was elected an Associate.

Mr. John Smith, Corresponding Member, sent for exhibition a specimen of the Cave Spider (*Meta menardi*, Latr.) from a cavern in the neighbourhood of Dunure, Ayrshire. Its web was placed a few feet above one of the cocoons or nests characteristic of this species, which hung from a dark recess in the upper part of the cave. There were also several old nests, hanging in their original position. One of the spider's webs in the cave measured fifteen inches in diameter, while the extremities of the longest threads were four feet apart, measuring over the web.

The remainder of the evening was devoted to an exhibition of lantern slides given by several members, and illustrative of various features of natural history and geology, as well as views of places visited at excursions of the Society. A unique series of slides, showing the protective value of the colour-markings of butterflies and moths, with regard to the sites chosen by them for resting, was exhibited by favour of Mr. A. H. Hamm, Oxford. Messrs. W. R. Baxter, Charles Kirk, T. Thornton Mackeith, and Hugh W. Wilson, showed fine slides, dealing mainly with various aspects of bird life, while those submitted by Messrs. Thomas W. Robertson, J. W. Reoch, and David R. Somerville dealt principally with

botanical, geological, and scenic features of nature. The artistic beauty of the varied pictures made the exhibition a very enjoyable one.

28TH JANUARY, 1908.

Mr. D. A. Boyd, President, in the chair.

The chairman referred to the loss which the Society had sustained in the death of Dr. Alexander Frew, one of the Ordinary Members, whose extensive and accurate knowledge of many branches of natural history, as well as his readiness in placing the results of his research at the service of members, were fittingly touched on.

Mr. Alexander Patience also paid a high tribute to the scientific attainments of Dr. Frew, who, for several years, had been investigating the marine fauna, not only of the Firth of Clyde, but of the West of Scotland generally, and had added many new records of Mollusca, as well as extended our knowledge of the distribution of many of the rarer forms.

It was moved and agreed that the Secretary should express to the widow of the deceased gentlemen the Society's sympathy with her in her bereavement.

On the motion of the chairman, it was also agreed that the Society should place upon record its sense of the loss sustained by science in the death of Mr. E. A. L. Batters, LL.B., B.A., F.L.S., one of the foremost authorities on the subject of the British Marine Algæ, and compiler of the list relating to that group in the British Association Handbook of the Fauna and Flora of the Clyde Area

Messrs. George W. Campbell, Ailsa Cottage, Coatbridge, and George A. Brown, 35 Sunnyside Road, Coatbridge, were elected Ordinary Members.

On behalf of Mr. J. R. Malloch, Bonhill, Mr. Alexander Ross brought before the meeting some interesting material sent for exhibition. This included a collection of dipterous insects belonging to the family *Phoridæ*, which had been captured in Dumbartonshire, mainly in the neighbourhood of Bonhill. Of the 52 species shown, 3 were new to the British list, and 29 new to science. As these flies are generally very small, Mr. Malloch had prepared accurate drawings of the wings of several species, so as to illustrate their characteristic venation.

He also submitted a collection of predatious Diptera, along with the prey upon which they were feeding when captured. The former consisted chiefly of specimens of *Scatophaga stercoraria*, L., and *S. squalida*, Mg., while the insects upon which they were feeding were various species of *Chironomidæ*, *Bibionidæ*, *Tipulidæ*, &c.

Mr. Malloch likewise showed specimens of *Neottiophilum præustum*, Mg., a dipteron new to the Clyde Area, which had been bred from pupæ taken from the nest of a Greenfinch.

On behalf of Mr. Charles Kirk, Mr. John Robertson showed a colour-photograph lantern-slide of eggs of the Razorbill and Common Guillemot. The variation in the colour and markings were brought out very distinctly. It was stated that this was probably the first occasion on which a slide of birds'-eggs photographed by the new Lumière process had been shown in Glasgow.

Mr. Alexander Patience read a paper descriptive of *Trichoniscus linearis* and *Philoscia patiencei*, two new British species of terrestrial Isopoda.

A paper entitled "Some observations on the Dipterous Family *Phoridæ*," communicated by Mr. J. R. Malloch (page 153), was read by Mr. Ross.

Messrs. R. B. Johnstone and D. A. Boyd submitted a Report on the Fungus Forays in 1907 (page 251).

25TH FEBRUARY, 1908.

Mr. J. Ballantyne, Vice-President, in the chair.

Messrs. J. G. Connell, 13 Ormonde Park, Muirend, Cathcart, and John Muir, 128 Ledard Road, Langside, were elected Ordinary Members.

Mr. Peter Macnair, F.R.S.E., F.G.S., exhibited a specimen of *Petromyzon marinus*, L., caught in the Clyde at Uddingston in July, 1907, and a specimen of *Centrina salviani*, Risso, from the North Sea. He described the peculiar anatomical features of these fishes, and stated that both species were very interesting—the one for having, during spawning time, come up the Clyde through the Broomielaw in safety, and the other from being for the first time found as far north as the British coast.

Professor Leonard A. L. King, M.A., gave a short lecture, descriptive of the *Pycnogonida* or "Sea-spiders." After giving an account of the appearance and habits of these animals, he described the structure and functions of the various segments and appendages of an individual pycnogonid belonging to the genus *Nymphon*, and referred to the characteristic features which distinguish the other genera represented in the fauna of the Clyde Sea Area. These were illustrated by the exhibition of a series of specimens.

Mr. R. S. Wishart, M.A., exhibited a specimen of Heather (*Calluna vulgaris*, L.) found embedded beneath the public road at Stepps, and recently exhumed in the course of operations for laying a drain. As the road was made more than a hundred years ago, the heather had been preserved in a fresh condition in the mossy ground all that time.

Mr. D. A. Boyd showed a specimen of *Geopyxis coccinea* (Jacq.) Mass., from Glen Almond, Perthshire.

A "List of *Pycnogonida* collected in the Clyde Area," communicated by Mr. Richard Elmhirst, F.L.S., was read by Professor King (page 146).

31st March, 1908.

Mr. Robert Garry, B.Sc., Vice-President, in the chair.

Mr. Alexander Ross drew the attention of the members present to a letter received from Dr. James Knight, St. James's Public School, in which he stated that Mr. James Paton, F.L.S., of the Kelvingrove Museum, and Mr. Thomas Lugton, of the People's Palace, were desirous that arrangements should be made for exhibiting the common wild-flowers of the district as they appear, and for that purpose would provide the necessary tables and glasses. They required, however, the co-operation of some botanical enthusiasts who would undertake to supply, once a week, the specimens needed, and also see that the plants were correctly named. Mr. Ross stated that this appeal had been sent to the Council, who decided to bring it before the Society, with a recommendation that all possible assistance should be given in the manner indicated.

Mr. Charles Kirk exhibited a Black-necked Grebe (*Podicepes nigricollis*, C. L. Brehm), from Helensburgh. He also submitted

several other interesting ornithological specimens, including examples of the Gadwall, *Anas strepera* (L.); Pintail, *Dafila acuta* (L.); Shoveler, *Spatula clypeata* (L.); Velvet Scoter, *Œdemia fusca* (L.); and Norfolk Plover or Stone-curlew, *Œdicnemus scolopax* (S. G. Gmelin).

Mr. Robert Dunlop showed a Grey Phalarope, *Phalaropus fulicarius* (L.), which had been shot on the Fifeshire coast.

Mr. R. S. Wishart, M.A., submitted a series of specimens of Hedgerow Plants from Buckinghamshire. These represented twenty-four species, most of which do not grow as natives in the West of Scotland.

Mr. Robert W. S. Wilson read a paper entitled "Autumn and Winter Bird-Life of the Fairlie Shore" (page 173).

Mr. James Whitton submitted "Meteorological Notes and Remarks upon the Weather during the year 1907, with its General Effects upon Vegetation" (page 188).

28TH APRIL, 1908

Mr. D. A. Boyd, President, in the chair.

Mr. James Vincent, Maryhill Public School, was elected an Ordinary Member.

Reports were submitted on Excursions to Calder Glen, Lochwinnoch (page 252), and Arran (page 253).

Mr. John Paterson exhibited a Great Grey Shrike, *Lanius excubitor*, L., obtained in Arran, and sent by Dr. Neil Fullarton, Lamlash. Mr. Paterson gave an account of the peculiarities and habits of this bird, and stated that the species had not hitherto been known to occur in Arran.

Mr. Alexander Ross exhibited specimens of the Twite (*Linota flavirostris*, L.) and Storm Petrel (*Procellaria pelagica*, L.) from Islay. He explained the characteristic features of these birds, and gave an account of their habits, with a description of their nests and eggs.

There were also submitted a photograph of a nest of the Stock-Dove (*C lumba œnas*, L.), found near the Cart in Renfrewshire, and a specimen of the bird itself.

Mr. Thomas W. Robertson exhibited a Glass-rope Sponge (*Hyalonema Sieboldii*, Gray), obtained off Tokio, Japan, from a

depth of over 300 fathoms, by means of a long line weighted and provided with hooks which were dragged along the sea-bottom. There was also shown under the microscope a slide containing several of the beautifully rayed silicious spicules of this species.

Mr. Ross read some notes on the Glass-rope Sponge. He stated that the species was first brought to Europe about the year 1830. It is a solid-looking ovoid body, from the lower end of which arises the long silicious glass-rope, composed of twisted strands of spicules which anchor the sponge in the mud. The upper end of the glass-rope is seen to terminate in a spike in a cavity in the interior of the sponge. An interesting account was given of the life-history and structure of this and other representatives of the Porifera.

Mr. Robertson also submitted a beautiful collection of Diatoms prepared as microscope slides. These included specimens from New Zealand, Bolivia, California, and Madagascar, with some selected forms from a tin of American oysters.

Mr. William Rennie read a paper entitled "Notes on the Birds frequenting Elder Park, Govan" (page 209).

Mr. D. A. Boyd read a paper on "Fungus-Parasites on Plant-Stems and Leaves."

26TH MAY, 1908.

Mr. D. A. Boyd, President, in the chair.

Mr. George Lunam, 14 Wilton Drive, Glasgow, was elected an Ordinary Member.

A report on an Excursion to Campsie Glen was submitted by Mr. Alexander Ross (page 255).

A beautiful specimen of the King Eider Duck, *Somateria spectabilis* (L.), from the neighbourhood of Tayport, was exhibited by Mr. Robert Dunlop. Mr. Alexander Ross made some remarks on the species, and described the features by which it is distinguished from the Common Eider Duck, *Somateria mollissima* (L.).

Mr. James J. F. X. King, F.E.S., exhibited a specimen of *Corymbetes æneus*, L., from Glen Callum Bay, South Bute, and stated that there were only two previous records of this beetle in Scotland.

Mr. Peter Macnair, F.R.S.E., F.G.S., read a paper on "The Fish Fauna of the Upper Silurian Inlier of Lesmahagow." He referred to the geological features of the ground, and showed that the rocks had been folded into a dome-shaped anticline which roughly coincided with Nutberry Hill. In the centre of the hill occurred the oldest rocks, which are of Wenlock age, and these passed upwards into a thick group of sandstones, mudstones, and conglomerates of Ludlow and Downtonian age. The first announcement of the existence of Upper Silurian fossils north of the Tweed was made in 1855 by the late Dr. Slimon of Lesmahagow. Within recent years, a remarkable group of fishes was discovered in these rocks, by means of which Dr. Traquair has been enabled to throw a flood of light upon the origin and descent of that highly problematical group of fishes known as the "Ostracodermi" or armour-plated fishes. A considerable diversity of opinion has always existed regarding the zoological affinities of these organisms, they having been referred by some to the Arthropoda and by others to the Tunicata. Dr. Traquair, in a series of valuable memoirs, has shown that the fishes from the Upper Silurian rocks of Lesmahagow are probably primitive Elasmobranchs, and that they supply the ancestral forms from which the highly specialized armour-plated fishes were descended through the Psammosteid and Drepanaspid types. Many specimens of *Thelodus*, *Lanarkia*, *Birkenia*, *Lausanius*, and *Psammosteus* were exhibited in illustration of the paper.

Mr. Robert Henderson submitted a List of Additions to the Diptera of the Clyde Faunal Area (page 156), being the third paper communicated by him on that subject.* It records the species belonging to the families from Anthomyidæ to Hippoboscidæ whose occurrence he has observed in the Clyde Area, together with a few unrecorded species belonging to families dealt with in his two former lists. Altogether, in this third paper, he is able to record in these families 308 species, of which 215 are additional to the list of Diptera published in the British Association Handbook of 1901. Many of these species are not yet on our recognised British List, and are but little known. In the course of some remarks on the increasing attention now being

* See *Transactions*, vol. vii., p. 148; vol. viii., p. 7.

bestowed on Diptera, Mr. Henderson referred to the successful work accomplished locally in that department of entomology by Messrs. A. Ross, J. R. Malloch, and James J. F. X. King, F.E.S. It is gratifying to know that the Clyde list, which Mr. Henderson now reckons as comprising upwards of a thousand species, is in Britain second only to that list which takes the whole kingdom as its field; and we may therefore look forward to having, at no distant date, a list of Diptera for the West of Scotland as approximately complete as that of any of the other groups of Insecta which have been so long and so well studied by local entomologists.

Mr. D. A. Boyd read a paper on "*Sclerotinia baccarum*, Rehm, and its Allies" (page 149). He also submitted a List of the Phycomycetes. Protomycetes, and Ustilagineæ, which occur as parasites on stems and leaves of plants within the Clyde Area.

23rd June, 1908.

Mr. D. A. Boyd, President, in the chair.

Mrs. E. L. Hardie, 34 Montague Street, Great Western Road, was elected an Ordinary Member.

Reports were submitted of Excursions from Balmaha to Rowardennan (page 255), and from Braidwood to Tillietudlem (page 257).

Mr. Robert W. S. Wilson exhibited a specimen of Richardson's Skua, *Stercorarius crepidatus* (Gmelin), shot at Brigaird Spit, between Fairlie and West Kilbride, on 1st November, 1902. It had previously been observed chasing the gulls on Fairlie Roads, and, when picked up, a small fish was found to be projecting from its bill. Mr. Wilson made some remarks on the habits of this species (page 235).

He also showed a Nightjar (*Caprimulgus europæus*, L.) which had been killed on 2nd October last by flying against a telegraph wire at Cardonald. In the course of some remarks he stated that the species is not common in the vicinity of Glasgow, but has occurred at Killoch Glen, Upper Pollok, Queen's Park, &c. The Nightjar is a bird of the twilight, and hawks for the moths which come abroad when the darkness is setting in. Its loud jarring note can be heard half-a-mile away when the night is still. The favourite haunts of the bird are the bracken-clad glades of

sheltered nooks and glens. It makes no nest, but lays its two eggs on the bare ground, which is not hollowed or prepared in any way.

Mr. William Rennie exhibited eggs of the Corn Bunting (*Emberiza miliaria*, L.), from Cadder Wilderness, and, for comparison, those of Yellow Bunting (*E. citrinella*, L.), and Reed Bunting (*E. schœniclus*, L.). A photograph of the nest and eggs of the Corn Bunting, taken at Cadder Wilderness, was submitted by Mr. Hugh W. Wilson.

On behalf of Mr. John E. Murphy, Mr. Alexander Ross exhibited specimens of the following species of Coleoptera:—

Bembidium quadriguttatum, F.—This was taken by Mr. Murphy at Fairlie, in July, 1907. The capture was noteworthy, as it made the first record for the West of Scotland. Fowler states that the beetle is rare in Scotland, and gives Lowlands, Tweed, and Forth as localities. In the South of England it is common and generally distributed, while in the North it is local but not rare. It belongs to the Ground Beetles, and may be found in moist places by the side of streams, rivers, or ponds, or on the sea-shore—indeed, in damp places, whether the water be fresh or salt. The smooth head has a deep but short furrow on each side; the thorax is remarkably convex in front, and in colour is shining blue-green or greenish-blue; and the elytra are rather convex, and their colour is similar to that of the thorax, but deepens into violet, which at times appears black. On the shoulder of each elytron is a triangular patch of dull white, and lower down another roundish patch. It is from these spots that the specific name is derived.

Notoxus monoceros, L.—This was taken in June, 1900, at Monkton. The beetle belongs to the family Anthicidæ, of which two species are recorded in the British Association list. It occurs in sandy places on the coast, and is recorded commonly from the East Coast of Scotland. It has not, however, been noted for the Clyde Area, and Mr. Murphy has so far been unable to trace any record for the West of Scotland. In this little insect the thorax is narrower than the abdomen, and tapers outwards above the head so as to form a sort of horn. The abdomen is blackish, marked with pale yellow spots. The antennæ and legs are reddish orange.

Leiopus nebulosus, L.—This was obtained by Mr. Murphy between Craigallion and Blanefield in August, 1906. It is rather interesting to find that Mr. G. A. Hardy, one of the members of the Society, took this rare species at Dumfin in August, 1907. These are the only two known records for the Clyde Area. The beetle is one of the Longicornes, and the larva, like those of all this group, is a wood-borer. It is found where its food-stuff abounds. In Scotland it is not rare in the East, as it has been recorded from woods near Edinburgh, Dalkeith Park, Roslin, and Berwickshire; while Mr. Murphy has also taken it at Rannoch. The head is vertical, flattened in front, and provided with a pair of long antennæ, which, when examined, are seen to present a ringed appearance, as the apical portion of each joint is dark-coloured, while the basal portion is pale-yellowish. The abdomen is long, and is well marked with dull whitish patches.

Mr. John Thomson exhibited a specimen of *Bactrodesma tiarata*, Stål., a stick-insect, from Rhodesia, being the so-called "Kaffir-god" of the natives.

Mr. Johnston Shearer showed specimens of Goat's-beard (*Tragopogon pratense*, L.) from Hundred-acre Park, one of the stations mentioned for the plant in Hennedy's *Clydesdale Flora*.

Mr. Peter Ewing, F.L.S., exhibited and described (p. 237) two forms of *Carex*, which he considered well worthy of recognition. These he had named *Carex saxatilis*, L., f. *intermedia*, and *C. saxatilis*, L., f. *glomerata*. For comparison, he also exhibited a series of specimens illustrative of *Carex vesicaria*, L., *C. saxatilis*, L., and *C. atrata*, L., and their various forms.

Mr. John R. Lee showed sections of the leaves of *Polytrichum*, and read some notes descriptive of their structural features (page 186).

Mr. D. A. Boyd showed specimens of *Bryum Duvalii*, Voit., from the Parish of Crawford, Lanarkshire, and read some notes regarding the same (page 218).

Mr. Robert Garry, B.Sc., exhibited specimens of several species of Fresh-water Algæ, including *Microthamnion Kützingianum*, Näg., from Ailsa Craig; *Spirotænia condensata*, Bréb., from Balmaha; and *Desmidium Swartzii* (?), Ag., from Milngavie.

Mr. D. A. Boyd submitted a List of Uredineæ which occur as parasites on stems and leaves of plants within the Clyde Area.

ABSTRACT STATEMENT OF ACCOUNTS—SESSION 1906-1907

1906.—Sept. 1.						
To Balance—Life Members' Fund Debentures,	£65	0	0			
Do., on loan at 4 per cent.,	87	0	0			
Do., in Bank,	5	10	0			
	£157	10	0			
Ordinary Fund in Bank and in Treasurer's hand,	150	5	4½			
				£307	15	4½
1907.—Aug. 31.						
To 133 Members' Annual Subscriptions, @ 7s. 6d.,				49	17	6
,, 12 Members' Arrears,				6	0	0
,, 8 Associates' Subscriptions, @ 5s.,				2	0	0
,, Interest,				9	16	2
,, *Transactions* sold,				0	17	5
,, Donation,				0	7	0
				£376	13	5½

From Balance of £124 5s. 5d. falls to be deducted cost of *Transactions* for Three Sessions.

1907.—Aug. 31.						
By Rent and Attendance,				£11	5	0
,, Postage, Stationery, &c.,				12	1	1
,, Printing Circulars,				16	16	4
,, Printing *Transactions*,				40	8	2
,, Carriage on *Transactions*,				1	5	3
,, Library—New Books,	£8	18	3½			
Insurance,	0	12	0			
Binding,	2	14	0			
Postage, &c.,	0	8	5			
				12	12	8½
,, Lantern Expenses,				0	9	6
,, Balance—Life Members' Fund, Debentures of the Modern Permanent Building and Investment Society, Melbourne,	£55	0	0			
,, In Bank,	102	10	0			
	£157	10	0			
,, Balance, Ordinary Fund in Bank,	£134	9	4			
Less due to Treasurer,	10	3	11			
	124	5	5			
				281	15	5
				£376	13	5½

GLASGOW, 23*rd October*, 1907.—We have examined the Accounts, compared same with the relative Vouchers and Securities, and find them correct. Cash due to Treasurer, Ten pounds three shillings and eleven pence.

(Signed) JAMES JACK,
JOSEPH SOMMERVILLE, } *Auditors.*

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